```
=> d his l75-

     FILE 'REGISTRY' ENTERED AT 13:35:23 ON 17 OCT 2006
L75            0 S (L7 OR L9) AND PT/ELS AND NB/ELS
                 E PLATINUM/CN
L76            1 S E3
                 E NIOBIUM/CN
L77            1 S E3

     FILE 'HCA' ENTERED AT 13:36:42 ON 17 OCT 2006
L78       141872 S L76
L79        66210 S L77
L80          112 S L78 AND L79 AND L46
L81           19 S L80 AND (L16 OR L17 OR L18)
L82           13 S L81 NOT (L19 OR L68 OR L70 OR L72 OR L74)


=> d l82 1-13 cbib abs hitstr hitind
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L82 ANSWER 1 OF 13 HCA COPYRIGHT 2006 ACS on STN

145:339219 Lithium **phosphate**-based low-cost electrode materials, their manufacture, cathodes therefrom, secondary lithium **batteries** therewith. Mori, Hiroyuki; Ono, Koji; Saito, Mitsumasa (Sumitomo Osaka Cement Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2006261061 A2 20060928, 16pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2005-80160 20050318.

AB The electrode materials comprise secondary particles of LixAyBzPO4 (A = Cr, Mn, Fe, Co, Ni, Cu; B = V, Sn, Sb, Nb, Zr, Mo, Ru; $0 < x < 2$; $0 < y < 1.5$; $0 \leq z < 1.5$) prepd. by assembling primary particles via electroconductive substances (e.g., C, Au, Pt). In manufg. of the materials, Li, A, B, and PO4 sources and the substances (or their precursors) are added to water-based solvents to give solns. or dispersions, which are sprayed and heated. Secondary lithium **batteries** equipped with cathodes from the materials show high discharge capacity and stable charge-discharge cycle performance.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses
(elec. conductors; secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57

ST secondary **battery** cathode tin doped iron lithium **phosphate** conductor; tin doped triphylite hydrothermal synthesis lithium **battery** cathode; conductor carbon aggregated iron lithium **phosphate battery** cathode

IT Carbon black, uses
Metals, uses
Oxides (inorganic), uses
(elec. conductors; secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

IT Secondary **batteries**
(lithium; secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

IT **Battery** cathodes
Electric conductors
Hydrothermal reactions
(secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

IT 57-50-1, Sucrose, processes
(elec. conductor precursors; secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

IT 7440-44-0P, Carbon, uses
(elec. conductors; secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

IT 7439-88-5, Iridium, uses 7439-98-7, Molybdenum, uses **7440-03-1**, Niobium, uses 7440-05-3, Palladium, uses **7440-06-4**, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-32-6, Titanium, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 12795-06-1, Carbon oxide
(elec. conductors; secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

IT 7440-31-5P, Tin, uses
(iron lithium **phosphate** doped with; secondary lithium **battery** cathode materials comprising tin-doped lithium

iron **phosphates** aggregated via elec. conductors)
IT 15365-14-7P, Iron lithium **phosphate** (FeLiPO4)
(triphylite-type, tin-doped; secondary lithium **battery** cathode materials comprising tin-doped lithium iron **phosphates** aggregated via elec. conductors)

L82 ANSWER 2 OF 13 HCA COPYRIGHT 2006 ACS on STN
145:66390 **Fuel cell** electrode containing metal **phosphate.** Park, Jung-Ock; Kang, Hyo-Rang (Samsung Sdi Co., Ltd., S. Korea). U.S. Pat. Appl. Publ. US 2006134507 A1 20060622, 8 pp. (English). CODEN: USXXCO. APPLICATION: US 2005-303940 20051219. PRIORITY: KR 2004-110174 20041222.
AB A **fuel cell** electrode includes a catalyst layer, which includes a supported metallic catalyst, a proton conductor including a metal **phosphate**, a binder, and a gas diffusion layer including an elec. conductive material.
IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses
(**fuel cell** electrode contg. metal **phosphate**)
RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

INCL 429044000; 502101000; 427115000; 429042000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **fuel cell** electrode metal **phosphate**
IT Catalysts
(electrocatalysts; **fuel cell** electrode contg. metal **phosphate**)
IT **Fuel cell** electrodes
Fuel cells
(**fuel cell** electrode contg. metal **phosphate**)
IT Oxides (inorganic), uses
(**fuel cell** electrode contg. metal **phosphate**)
IT **Phosphates**, uses
(metal; **fuel cell** electrode contg. metal **phosphate**)
IT Ionic conductors

(protonic; **fuel cell** electrode contg. metal
phosphate)
IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses **7440-06-4**, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-25-7, Tantalum, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-44-0, Carbon, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7782-49-2, Selenium, uses 13565-97-4, Zirconium pyrophosphate
(**fuel cell** electrode contg. metal
phosphate)
IT 7664-38-2, Phosphoric acid, processes
(**fuel cell** electrode contg. metal
phosphate)
IT 10279-57-9 11105-11-6, Tungsten trioxide hydrate 12164-98-6, Zirconia hydrate 12214-43-6, Titania hydrate 13765-94-1 13765-95-2, Zirconium **phosphate** 14417-93-7, Tin **phosphate** 17347-75-0, Tungsten **phosphate** 22650-91-5, Tin dioxide hydrate 23400-22-8, Molybdenum dioxide dihydrate 25013-42-7, Molybdenum **phosphate** 51404-74-1, Silicon **phosphate**
(**fuel cell** electrode contg. metal
phosphate)
IT 1310-73-2, Sodium hydroxide, uses 7647-01-0, Hydrochloric acid, uses 7664-41-7, Ammonia, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses
(**fuel cell** electrode contg. metal
phosphate)
IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, Isopropyl alcohol, uses 123-86-4, n-Butyl acetate 540-88-5, tert-Butyl acetate 7732-18-5, Water, uses
(**fuel cell** electrode contg. metal
phosphate)

L82 ANSWER 3 OF 13 HCA COPYRIGHT 2006 ACS on STN
140:276261 Anodically treated biocompatible metal implants. Minevski, Zoran; Nelson, Carl (Lynntech Coatings, Ltd., USA). PCT Int. Appl. WO 2004024202 A1 20040325, 40 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA,

GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US29100 20030916. PRIORITY: US 2002-245821 20020916; US 2003-353622 20030129; US 2003-353613 20030129.

AB A biocompatible surgical implant or component for a surgical implant for use in human beings and animals is described. The implant has an oxide film-forming valve metal substrate, such as titanium, titanium alloy, zirconium, or zirconium alloy, or stainless steel, or cobalt-chromium-molybdenum alloy having a surface that has been treated such that phosphorous and oxygen are incorporated into the treated surface of the implant. The surface treatment carried out on the implant includes low temp. anodic treatment of the substrate in a phosphorus-contg. soln., such as a **phosphate**-contg. soln. The anodic treatment changes or modifies the substrate surface through electrochem. reactions between the substrate, acting as an anode, and **phosphate** ions contained in an electrolyte soln., such as provided by an aq. soln. of phosphoric acid. The phosphorus-contg. soln. may be substantially calcium-free. The anodic treatment is effective on various metal surfaces, including alloys contg. less than 98% titanium. For example, implants having a Ti-6Al-4V alloy core covered with a porous Ti layer bonded to the alloy surface were **phosphate** surface treated in an **electrolytic cell** as the anode. The **electrolyte** in the **cell** was an aq. soln. of 0.33 N H_3PO_4, the applied voltage was 50 V, and the voltage was applied for 30 min at an electrolyte temp. of 25°. The implants emerged from the cells had gold color. After implantation to the proximal humerus of dogs, implants had more bone and marrow tissue and less fibrous tissue directly attached to the treated surface then the control non-treated implants group.

IT **7440-03-1**, Niobium, biological studies **7440-06-4**, Platinum, biological studies
(anodically treated metal implants for improvement of biocompatibility)

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM A61L027-32
ICS A61L027-50; A61L031-08; A61L031-14; A61L027-06; A61L031-02

CC 63-7 (Pharmaceuticals)
Section cross-reference(s): 55, 56

IT 7429-90-5, Aluminum, biological studies 7439-89-6, Iron, biological studies 7439-96-5, Manganese, biological studies 7439-98-7, Molybdenum, biological studies 7440-02-0, Nickel, biological studies **7440-03-1**, Niobium, biological studies 7440-05-3, Palladium, biological studies **7440-06-4**, Platinum, biological studies 7440-18-8, Ruthenium, biological studies 7440-22-4, Silver, biological studies 7440-25-7, Tantalum, biological studies 7440-32-6, Titanium, biological studies 7440-41-7, Beryllium, biological studies 7440-47-3, Chromium, biological studies 7440-48-4, Cobalt, biological studies 7440-50-8, Copper, biological studies 7440-57-5, Gold, biological studies 7440-58-6, Hafnium, biological studies 7440-62-2, Vanadium, biological studies 7440-65-5, Yttrium, biological studies 7440-67-7, Zirconium, biological studies 7782-42-5, Graphite, biological studies 12597-68-1, Stainless steel, biological studies 12743-70-3, Ti-6Al-4V 214132-29-3, Vitreloy 1
(anodically treated metal implants for improvement of biocompatibility)

IT 7664-38-2, Phosphoric acid, processes 7664-38-2D, Phosphoric acid, alkali metal salts 14265-44-2, **Phosphate**, processes
(anodically treated metal implants for improvement of biocompatibility)

L82 ANSWER 4 OF 13 HCA COPYRIGHT 2006 ACS on STN

140:258238 Mediated electrochemical oxidation of inorganic materials for decontamination. Carson, Roger W.; Bremer, Bruce W. (The C & M Group, Llc, USA). PCT Int. Appl. WO 2004024634 A2 20040325, 106 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US28200 20030910. PRIORITY: US 2002-409202P 20020910.

AB A mediated electrochem. oxidn. process and app. for the use of mediated electrochem. oxidn. (MEO) for the oxidn., conversion/recovery, and decontamination (such as cleaning equipment and containers, etc.) of all previously defined inorg. solid, liq., and gases where higher oxidn. states exist which includes, but is not limited to, halogenated inorg. compds. (except fluorinated), inorg. pesticides and herbicides, inorg. fertilizers, carbon residues, inorg. carbon compds., mineral formations, mining tailings, inorg. salts, metals and metal compds., etc.; and combined

waste (e.g. a mixt. of any of the foregoing with each other or other non-inorg. materials) henceforth collectively referred to as inorg. waste. The inorg. materials are introduced into an app. for contacting the inorg. materials with an electrolyte contg. the oxidized form of one or more reversible redox couples, at least one of which is produced electrochem. by anodic oxidn. at the anode of an **electrochem. cell.** The oxidized forms of any other redox couples present are produced either by similar anodic oxidn. or reaction with the oxidized form of other redox couples present and capable of affecting the required redox reaction. The oxidized species of the redox couples oxidize the inorg. waste mols. and are themselves converted to their reduced form, whereupon they are reoxidized by either of the aforementioned mechanisms and the redox cycle continues until all oxidizable waste species, including intermediate reaction products, have undergone the desired degree of oxidn. The entire process takes place at temps. slightly above 0° slightly below the b.p. of the electrolyte (which is normally 100°), thereby avoiding the formation of either volatile inorg. or org. compds. The oxidn. process may be enhanced by the addn. of reaction enhancements, such as: ultrasonic energy and /or UV radiation.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses
(mediated electrochem. oxidn. of inorg. materials for decontamination)

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM C02F
CC 60-5 (Waste Treatment and Disposal)
IT Azides
Bromides, uses
Chlorides, uses
Iodides, uses
Nitrates, uses
Nitrites
Phosphates, uses
Phosphites
Selenites
Sulfates, uses

Sulfites
Thiocyanates
(mediated electrochem. oxidn. of inorg. materials for decontamination)

IT 64-18-6D, Formic acid, salts 1310-73-2, Sodium hydroxide, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-97-6, Mercury, uses 7439-98-7, Molybdenum, uses 7439-99-8, Neptunium, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses 7440-05-3, Palladium, uses **7440-06-4**, Platinum, uses 7440-07-5, Plutonium, uses 7440-08-6, Polonium, uses 7440-10-0, Praseodymium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-24-6, Strontium, uses 7440-25-7, Tantalum, uses 7440-27-9, Terbium, uses 7440-28-0, Thallium, uses 7440-29-1, Thorium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-35-9, Americium, uses 7440-38-2, Arsenic, uses 7440-39-3, Barium, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-58-6, Hafnium, uses 7440-61-1, Uranium, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7704-34-9, Sulfur, uses 7722-84-1, Hydrogen peroxide, uses 7723-14-0, Phosphorus, uses 7726-95-6, Bromine, uses 7727-37-9, Nitrogen, uses 7782-49-2, Selenium, uses 7782-50-5, Chlorine, uses 10028-15-6, Ozone, uses 13494-80-9, Tellurium, uses 14362-44-8, Atomic iodine, uses
(mediated electrochem. oxidn. of inorg. materials for decontamination)

L82 ANSWER 5 OF 13 HCA COPYRIGHT 2006 ACS on STN

140:256345 Fabrication of cathode active material of a lithium-sulfur **battery**. Choi, Soo-Seok; Choi, Yun-Suk; Han, Ji-Seong; Park, Seung-Hee; Jung, Yong-Ju; Lee, Il-Young (Samsung SDI Co., Ltd., S. Korea). U.S. Pat. Appl. Publ. US 2004058246 A1 20040325, 25 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-405237 20030403. PRIORITY: KR 2002-57576 20020923.

AB A pos. active material of a lithium-sulfur **battery** includes a sulfur-conductive agent-agglomerated complex in which a conductive agent particle is attached onto a surface of a sulfur particle having an av. particle size less than or equal to 7 μm. The sulfur-conductive agent-agglomerated complex is manufd. by mixing a sulfur powder and a conductive agent powder to form a mixt., and milling the mixt.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses
(fabrication of cathode active material of lithium-sulfur **battery**)

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M004-62
ICS H01M004-58
INCL 429232000; 429218100; 252182100; 429217000; 429231950
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST cathode active material lithium sulfur **battery**
IT Polyoxyalkylenes, uses
(alkylated; fabrication of cathode active material of lithium-sulfur **battery**)
IT Cork
Pitch
(carbon precursor; fabrication of cathode active material of lithium-sulfur **battery**)
IT Nanotubes
(carbon; fabrication of cathode active material of lithium-sulfur **battery**)
IT Telephones
(cellular; fabrication of cathode active material of lithium-sulfur **battery**)
IT Clocks
(digital; fabrication of cathode active material of lithium-sulfur **battery**)
IT Toys
(electronic; fabrication of cathode active material of lithium-sulfur **battery**)
IT **Battery** cathodes
(fabrication of cathode active material of lithium-sulfur **battery**)
IT Carbon black, uses
Carbon fibers, uses
Fluoropolymers, uses
Group IIIA elements
Group IVA elements
Polymer blends
Polyoxyalkylenes, uses
Transition metals, uses
(fabrication of cathode active material of lithium-sulfur

battery)

IT Secondary **batteries**
(lithium; fabrication of cathode active material of lithium-sulfur **battery**)

IT Computers
Television
(portable; fabrication of cathode active material of lithium-sulfur **battery**)

IT Metals, uses
(powder; fabrication of cathode active material of lithium-sulfur **battery**)

IT Polyacetylenes, uses
Polyanilines
(protective layer; fabrication of cathode active material of lithium-sulfur **battery**)

IT Acoustic devices
(radios, two-way; fabrication of cathode active material of lithium-sulfur **battery**)

IT Lithium alloy, base
(fabrication of cathode active material of lithium-sulfur **battery**)

IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 11102-77-5 12798-95-7 18282-10-5, Tin dioxide 22465-17-4, Titanium nitrate 51398-14-2 51401-38-8 51401-52-6 51401-53-7 53680-59-4 58504-18-0 70246-24-1 77194-67-3 77194-68-4 77194-69-5 97686-54-9
(fabrication of cathode active material of lithium-sulfur **battery**)

IT 7439-88-5, Iridium, uses 7439-92-1, Lead, uses 7439-97-6, Mercury, uses 7439-98-7, Molybdenum, uses **7440-03-1**, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses **7440-06-4**, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-26-8, Technetium, uses 7440-31-5, Tin, uses 7440-33-7, Tungsten, uses 7440-43-9, Cadmium, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses 7704-34-9D, Sulfur, compd. 7782-42-5, Graphite, uses 9002-84-0, Ptfe 9002-86-2, Polyvinyl chloride 9002-89-5, Polyvinyl alcohol 9003-19-4, Polyvinyl ether 9003-20-7, Polyvinyl acetate 9003-32-1, Polyethyl acrylate 9003-39-8, Polyvinyl pyrrolidone 9003-47-8, Polyvinylpyridine 9003-53-6, Polystyrene 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 13463-67-7, Titanium oxide, uses 15578-32-2, Stannous **phosphate** 24937-79-9, Pvdf 25014-41-9, Polyacrylonitrile 25322-68-3, Peo 25322-68-3D, Peo, alkylated 58799-80-7, Cobalt lanthanum strontium oxide colasro3 141067-82-5, Lanthanum manganese strontium oxide lamnsro3

(fabrication of cathode active material of lithium-sulfur **battery**)

IT 7440-44-0, Carbon, uses
(nanotubes; fabrication of cathode active material of lithium-sulfur **battery**)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7440-02-0, Nickel, uses 7440-20-2, Scandium, uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses
(powder; fabrication of cathode active material of lithium-sulfur **battery**)

IT 7439-95-4, Magnesium, uses 7440-42-8, Boron, uses 7440-55-3, Gallium, uses 7440-70-2, Calcium, uses 10377-52-3, Lithium **phosphate** 12627-14-4, Lithium silicate 12676-27-6 25067-58-7, Polyacetylene 25190-62-9, Poly(p-phenylene) 25233-30-1, Polyaniline 25233-34-5, Polythiophene 26009-24-5, Poly(p-phenylene vinylene) 28774-98-3, Poly(naphthalene-2,6-diyl) 30604-81-0, Polypyrrole 114239-80-4, Poly(perinaphthalene) 236388-73-1, Lithium silicide sulfide 236388-74-2, Lithium boride sulfide 236388-75-3, Aluminum lithium sulfide 355408-23-0, Lithium nitride phosphide
(protective layer; fabrication of cathode active material of lithium-sulfur **battery**)

L82 ANSWER 6 OF 13 HCA COPYRIGHT 2006 ACS on STN
140:238481 Lithium vanadium oxide thin-film **battery**.
Neudecker, Bernd J.; Lanning, Bruce; Benson, Martin H.; Armstrong, Joseph H. (USA). U.S. Pat. Appl. Publ. US 2004048157 A1 20040311, 30 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-238905 20020911.

AB The manuf. and use of multilayer thin-film **batteries**, such as inverted lithium-free **batteries** is explained. The present invention provides a **battery** that may include a lithium vanadium oxide $Li_xV_2O_y$ ($0<x\leq100$, $0<y\leq5$) pos. cathode or neg. anode. The present invention may also provide for a thin-film **battery** that may be formed on a wide variety of substrate materials and geometries.

IT **7440-03-1**, Niobium, uses
(dopant; lithium vanadium oxide thin-film **battery**)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

IT **7440-06-4**, Platinum, uses
(lithium vanadium oxide thin-film **battery**)

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M004-48
ICS H01M004-66; B05D005-12
INCL 429231200; 429231500; 429245000; 029623500; 427126300
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium vanadium oxide thin film **battery**
IT Electric arc
(cathodic, deposition; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(chem.; lithium vanadium oxide thin-film **battery**)
IT Sputtering
(diode, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(electron-beam, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)
IT Plasma
(evapn. assisted by; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(ion plating, plasma assisted; lithium vanadium oxide thin-film **battery**)
IT **Battery** anodes
Battery cathodes
Molecular beam epitaxy
Primary **batteries**
(lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(photochem.; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(plasma, electron-beam directed, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)
IT Alcohols, uses
(polyhydric, support; lithium vanadium oxide thin-film **battery**)
IT Laser radiation
(pulsed, deposition; lithium vanadium oxide thin-film **battery**)
IT Electron beam evaporation
Magnetron sputtering
(reactive and nonreactive; lithium vanadium oxide thin-film **battery**)

IT Ceramics
Semiconductor materials
(support; lithium vanadium oxide thin-film **battery**)

IT Alloys, uses
Glass, uses
Metals, uses
Polyamides, uses
Polycarbonates, uses
Polyesters, uses
Polyimides, uses
Polysiloxanes, uses
Polyurethanes, uses
Rubber, uses
(support; lithium vanadium oxide thin-film **battery**)

IT Evaporation
(thermal, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)

IT Vapor deposition process
(vacuum; lithium vanadium oxide thin-film **battery**)

IT 1344-28-1, Aluminum oxide, uses 7631-86-9, Silica, uses 11104-85-1, Molybdenum silicide 11105-01-4, Silicon nitride oxide 11115-87-0, Hafnium nitride 11116-16-8, Titanium nitride 11116-19-1, Yttrium carbide 11116-21-5, Yttrium nitride 11129-37-6, Hafnium carbide 11130-49-7, Chromium carbide 11130-73-7, Tungsten carbide 12007-23-7, Hafnium boride 12033-62-4, Tantalum nitride (TaN) 12033-89-5, Silicon nitride, uses 12069-94-2, Niobium carbide 12070-08-5, Titanium carbide 12070-10-9, Vanadium carbide (VC) 12070-14-3, Zirconium carbide (ZrC) 12626-44-7, Chromium silicide 12626-91-4, Molybdenum boride 12627-39-3, Tungsten boride 12627-41-7, Tungsten silicide 12627-57-5, Molybdenum carbide 12633-97-5, Aluminum nitride oxide 12648-34-9, Niobium nitride 12653-55-3, Chromium boride 12653-77-9, Niobium boride 12653-85-9, Tantalum boride 12653-88-2, Vanadium boride 12673-91-5, Titanium boride 12674-04-3, Vanadium nitride 12705-37-2, Chromium nitride 12738-91-9, Titanium silicide 12741-10-5, Zirconium boride 24304-00-5, Aluminum nitride 37189-51-8, Zirconium silicide 37245-81-1, Molybdenum nitride 37271-26-4, Titanium nitride oxide 37359-53-8, Tungsten nitride 39336-13-5, Niobium silicide 51680-51-4, Tantalum carbide 52037-56-6, Vanadium silicide 53801-50-6, Yttrium boride 60304-33-8, Hafnium silicide 102427-06-5, Yttrium silicide 107992-37-0, Silicon carbide (Si0-1C0-1) 113443-18-8, Silicon monoxide 119173-61-4, Zirconium nitride 184905-46-2, Lithium nitrogen phosphorus oxide
(barrier layer; lithium vanadium oxide thin-film **battery**
)

IT 7440-50-8, Copper, uses 12054-11-4, Cusn 12597-68-1, Stainless steel, uses 12767-50-9, Phosphor bronze

(current collector; lithium vanadium oxide thin-film **battery**)

IT 7440-44-0, Diamond-like carbon, uses
(diamond-like, barrier layer; lithium vanadium oxide thin-film **battery**)

IT 1333-74-0, Hydrogen, uses 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses 7440-09-7, Potassium, uses 7440-17-7, Rubidium, uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-25-7, Tantalum, uses 7440-28-0, Thallium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-38-2, Arsenic, uses 7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-45-1, Cerium, uses 7440-46-2, Cesium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-58-6, Hafnium, uses 7440-65-5, Yttrium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7723-14-0, Phosphorus, uses
(dopant; lithium vanadium oxide thin-film **battery**)

IT 1314-34-7, Vanadium trioxide 15060-59-0, Lithium vanadium oxide livo3 15593-56-3, Lithium vanadium oxide li3vo4
(lithium vanadium oxide thin-film **battery**)

IT 1313-13-9, Manganese dioxide, uses 1314-62-1, Vanadium oxide (V2O5), uses 7439-88-5, Iridium, uses 7440-05-3, Palladium, uses **7440-06-4**, Platinum, uses 7440-22-4, Silver, uses 7440-42-8, Boron, uses 7440-43-9, Cadmium, uses 7440-57-5, Gold, uses 10045-86-0, Iron **phosphate** fepo4 11126-15-1, Lithium vanadium oxide 12017-95-7, Chromium lithium manganese oxide CrLiMnO4 12031-65-1, Lithium nickel oxide linio2 12031-95-7, Lithium titanium oxide li4ti5o12 12036-21-4, Vanadium oxide vo2 12037-42-2, Vanadium oxide v6o13 12039-13-3, Titanium disulfide 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 12359-27-2, Vanadyl **phosphate** 14024-11-4, Aluminum lithium chloride allicl4 15365-14-7, Iron lithium **phosphate** felipo4 39457-42-6, Lithium manganese oxide 55326-82-4, Lithium titanium sulfide litis2 66102-93-0, Cobalt lithium nitride 83348-01-0, Lithium vanadyl **phosphate** LiVOPO4 131500-40-8, Tin nitride oxide silicide 144769-06-2, Lead oxide PbO0-2 170171-06-9, Aluminum lithium fluoride allif4 199923-81-4, Aluminum cobalt lithium oxide ((Al,Co)LiO2) 258511-25-0, Lithium manganese nitride 268747-59-7, Chromium manganese oxide Cr0.5Mn0.5O2 371148-86-6, Tin oxide SnO0-2 666836-39-1, Tin nitride (SnN0-1.33) 666836-40-4, Indium nitride (InN0-1) 666836-41-5, Zinc nitride

(ZnN0-0.67) 666836-42-6, Copper nitride (CuN0-0.33) 666836-43-7, Nickel nitride (NiN0-0.33) 666836-44-8, Indium oxide (InO0-1.5)
(lithium vanadium oxide thin-film **battery**)

IT 7782-42-5, Graphite, uses
(support; lithium vanadium oxide thin-film **battery**)

IT 7439-93-2, Lithium, processes 7440-62-2, Vanadium, processes 12031-80-0, Lithium oxide li2o2 12057-24-8, Lithium oxide (Li2O), processes 26134-62-3, Lithium nitride (Li3N)
(target material; lithium vanadium oxide thin-film **battery**)

L82 ANSWER 7 OF 13 HCA

139:126175 Electrolytes for high voltage wet tantalum or aluminum **capacitors**. Liu, Yanming; Shah, Ashish (Wilson Greatbatch Technologies, Inc., USA). U.S. Pat. Appl. Publ. US 2003142464 A1 20030731, 5 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-354324 20030130. PRIORITY: US 2002-353895P 20020131.

AB This invention is directed to an electrolyte for high voltage wet tantalum or aluminum **capacitors**. The present invention is directed to an electrolyte for an electrolytic **capacitor**. The **capacitor** has an electrolytic anode and an electrochem. cathode. The electrolyte has H2O, a H2O sol. org. salt, and a relatively weak org. acid. This electrolyte is chem. compatible to Al and Ta oxide dielecs. and withstands higher voltage while maintaining good cond. This makes the electrolyte esp. useful for high voltage applications, such as occur in an implantable cardiac defibrillator.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses
(**capacitor** anode material; electrolytes for high voltage wet tantalum or aluminum **capacitors**)

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M006-04
ICS H01G009-02

INCL 361504000; 252062200

CC 76-10 (Electric Phenomena)
Section cross-reference(s): 63, 72

ST aluminum tantalum electrolytic **capacitor** defibrillator

implant
IT Electrolytic **capacitors**
(anodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Carbides
Carbonitrides
Nitrides
Oxides (inorganic), uses
(**capacitor** cathode material; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Amides, uses
Carbonates, uses
Esters, uses
Glycols, uses
Nitriles, uses
Polyoxyalkylenes, uses
(**capacitor** electrolyte contg.; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Prosthetic materials and Prosthetics
(cardiovascular implants, defibrillators; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Electrolytic **capacitors**
(cathodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Electrolytes
Electrolytic **capacitors**
(electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT **Capacitor** electrodes
(electrolytic-**capacitor** anodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT **Capacitor** electrodes
(electrolytic-**capacitor** cathodes; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Anodes
Cathodes
(electrolytic-**capacitor**; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Glycols, uses
(ethers, **capacitor** electrolyte contg.; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT Ethers, uses
(glycol, **capacitor** electrolyte contg.; electrolytes for high voltage wet tantalum or aluminum **capacitors**)
IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses

7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-48-4, Cobalt, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses
(**capacitor** anode material; electrolytes for high voltage wet tantalum or aluminum **capacitors**)

IT 11113-84-1, Ruthenium oxide
(**capacitor** cathode material; electrolytes for high voltage wet tantalum or aluminum **capacitors**)

IT 57-55-6, Propylene glycol, uses 62-23-7, 4-Nitrobenzoic acid 68-12-2, Dimethylformamide, uses 75-05-8, Acetonitrile, uses 75-12-7, Formamide, uses 75-98-9, Trimethylacetic acid 78-40-0, Triethyl **phosphate** 79-09-4, Propionic acid, uses 79-16-3, Methylacetamide 79-31-2, Isobutyric acid 88-75-5, 2-Nitrophenol 91-23-6, 2-Nitroanisole 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 99-61-6, 3-Nitrobenzaldehyde 100-02-7, 4-Nitrophenol, uses 100-17-4, 4-Nitroanisole 100-19-6 105-58-8, Diethyl carbonate 107-12-0, Propionitrile 107-21-1, Ethylene glycol, uses 107-92-6, Butyric acid, uses 108-29-2, γ-Valerolactone 108-32-7, Propylene carbonate 109-52-4, Valeric acid, uses 109-86-4, Ethylene glycol monomethyl ether 110-80-5, Ethylene glycol monoethyl ether 111-46-6, Diethylene glycol, uses 111-76-2, Glycol monobutyl ether 111-77-3, Diethylene glycol methyl ether 121-89-1 121-92-6, 3-Nitrobenzoic acid 127-19-5, Dimethylacetamide 504-63-2, Trimethylene glycol 512-56-1, Trimethyl **phosphate** 513-02-0, Triisopropyl **phosphate** 552-16-9, 2-Nitrobenzoic acid 552-89-6, 2-Nitrobenzaldehyde 554-84-7, 3-Nitrophenol 555-03-3, 3-Nitroanisole 555-16-8, 4-Nitrobenzaldehyde, uses 603-11-2, 3-Nitrophthalic acid 610-27-5, 4-Nitrophthalic acid 612-25-9, 2-Nitrobenzyl alcohol 614-21-1, 2-Nitroacetophenone 616-38-6, Dimethyl carbonate 617-84-5, Diethylformamide 619-25-0, 3-Nitrobenzyl alcohol 619-73-8, 4-Nitrobenzyl alcohol 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 627-45-2, Ethylformamide 872-36-6, Vinylene carbonate 872-50-4, N-Methyl-2-pyrrolidone, uses 1320-67-8, Propylene glycol methyl ether 1336-21-6, Ammonium hydroxide 4437-85-8, Butylene carbonate 7664-38-2, Phosphoric acid, uses 14287-04-8, Ammonium butyrate 17496-08-1, Ammonium propionate 22077-65-2, Propanoic acid, 2,2-dimethyl-, ammonium salt 22228-82-6, Ammonium isobutyrate 25322-68-3 34590-94-8, Dipropylene glycol methyl ether 35363-40-7, Ethyl propyl carbonate 35915-22-1, Methylbutyric acid 42739-38-8, Ammonium valerate 56525-42-9, Methyl propyl carbonate 83579-64-0, Butanoic acid, 2-methyl-, ammonium salt
(**capacitor** electrolyte contg.; electrolytes for high voltage wet tantalum or aluminum **capacitors**)

L82 ANSWER 8 OF 13 HCA COPYRIGHT 2006 ACS on STN

139:122002 Mediated electrochemical oxidation of destruction of sharps. Carson, Roger W.; Bremer, Bruce W. (The C & M Group, Llc, USA). PCT Int. Appl. WO 2003061714 A2 20030731, 104 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US2151 20030124. PRIORITY: US 2002-350352P 20020124.

AB A mediated electrochem. oxidn. process is used for sterilization/disinfection of contaminated instruments and infectious waste. Some sharps are decompd. into metallic ions in the anolyte, others are sterilized but not decompd., depending on the type of sharp. Contaminated instruments and wastes, solid or liq., are introduced into an app. for contacting the infectious waste with an electrolyte contg. the oxidized form of one or more reversible redox couples, at least one of which is produced at the anode of an **electrochem. cell**. The oxidized species of the redox couples oxidize the infectious waste mols. and are themselves converted to their reduced form, whereupon they are reoxidized by either of the aforementioned mechanisms and the redox cycle continues until all oxidizable infectious waste species have undergone the desired degree of oxidn. The entire process takes place at temps. between ambient and approx. 100 °C. The oxidn. process will be enhanced by the addn. of reaction enhancements, such as: ultrasonic energy and/or UV radiation.

IT **7440-03-1**, Niobium, processes **7440-06-4**, Platinum, processes
(incorporated into isopolyanion mediator; mediated electrochem. oxidn. of destruction of sharps, adding enhancements such as ultrasonic energy or UV radiation)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM A61L
CC 60-4 (Waste Treatment and Disposal)
Section cross-reference(s): 59
IT 71-47-6, Formate, processes 71-52-3, processes 302-04-5, Thiocyanate, processes 463-79-6, Carbonic acid, processes 563-69-9, Carbonoperoxoic acid 1301-96-8, Silver oxide (AgO) 1303-52-2, Gold hydroxide (Au(OH)3) 1303-58-8, Gold oxide (Au2O3) 1304-29-6, Barium peroxide (Ba(O2)) 1305-79-9, Calcium peroxide (Ca(O2)) 1306-38-3, Cerium oxide (CeO2), processes 1308-04-9, Cobalt oxide (Co2O3) 1308-14-1, Chromium hydroxide (Cr(OH)3) 1308-38-9, Chromium oxide (Cr2O3), processes 1309-60-0, Lead oxide (PbO2) 1312-46-5, Iridium oxide (Ir2O3) 1313-13-9, Manganese oxide (MnO2), processes 1313-27-5, Molybdenum oxide (MoO3), processes 1313-96-8, Niobium oxide (Nb2O5) 1313-97-9, Neodymium oxide (Nd2O3) 1314-06-3, Nickel oxide (Ni2O3) 1314-15-4, Platinum oxide (PtO2) 1314-18-7, Strontium peroxide (Sr(O2)) 1314-22-3, Zinc peroxide (Zn(O2)) 1314-27-8, Lead oxide (Pb2O3) 1314-32-5, Thallium oxide (Tl2O3) 1314-35-8, Tungsten oxide (WO3), processes 1314-41-6, Lead oxide (Pb3O4) 1314-62-1, Vanadium oxide (V2O5), processes 1317-36-8, Lead oxide (PbO), processes 1317-54-0, Ferrite (ferrospinel) 1344-55-4, Titanium oxide peroxide (TiO(O2)) 1344-58-7, Uranium oxide (UO3) 1345-13-7, Cerium oxide (Ce2O3) 2466-09-3, Diphosphoric acid 3812-32-6, Carbonate, processes 7601-90-3, Perchloric acid, processes 7722-86-3, Peroxymonosulfuric acid 7738-94-5, Chromic acid (H2CrO4) 7778-39-4, Arsenic acid (H3AsO4) 7782-68-5, Iodic acid (HIO3) 7782-91-4 7783-03-1 7783-08-6, Selenic acid 7789-31-3, Bromic acid 7790-92-3, Hypochlorous acid 7790-93-4, Chloric acid 10043-35-3, Boric acid (H3BO3), processes 10343-62-1, Metaphosphoric acid (HPO3) 10380-08-2, Triphosphoric acid 11116-47-5, Molybdate 11120-48-2, Telluric acid 12002-97-0, Silver oxide (Ag2O3) 12005-67-3, Americium oxide (AmO2) 12016-80-7, Cobalt hydroxide oxide (Co(OH)O) 12017-00-4, Cobalt oxide (CoO2) 12018-01-8, Chromium oxide (CrO2) 12030-49-8, Iridium oxide (IrO2) 12030-50-1, Iridium oxide (IrO3) 12035-36-8, Nickel oxide (NiO2) 12036-04-3, Palladium oxide (PdO2) 12036-05-4, Praseodymium oxide (PrO2) 12036-10-1, Ruthenium oxide (RuO2) 12036-15-6, Terbium oxide (TbO2) 12036-32-7, Praseodymium oxide (Pr2O3) 12036-35-0, Rhodium oxide (Rh2O3) 12036-36-1, Ruthenium oxide (RuO3) 12036-41-8, Terbium oxide (Tb2O3) 12036-71-4 12048-50-9, Bismuth oxide (BiO2) 12054-72-7 12059-95-9, Plutonium oxide (PuO2) 12060-06-9, Ruthenium oxide (Ru2O3) 12125-54-1 12133-57-2, Cerium oxide (CeO3) 12134-79-1, Germanium hydroxide oxide (Ge(OH)2O) 12135-13-6, Mercury hydroxide (Hg(OH)2) 12135-42-1, Ruthenium hydroxide (Ru(OH)3) 12135-49-8 12137-27-8, Rhodium oxide (RhO2) 12137-44-9, Ruthenium oxide (Ru2O5) 12143-28-1, Polonium oxide (PoO3) 12165-03-6, Plutonium oxide (Pu2O5) 12168-64-8 12179-34-9 12181-34-9 12188-35-1

12254-53-4 12258-53-6 12298-67-8, Mercury peroxide (Hg(O2))
12298-97-4, Zirconyl ion(2+) 12299-69-3 12299-76-2, Plumbate
(Pb(OH)O1-) 12300-16-2 12311-78-3, Plutonium oxide (PuO3)
12323-66-9, Americyl ion(2+) 12401-90-0, Neodymium oxide (NdO2)
12447-33-5 12503-09-2 12529-60-1, Germanate (Ge5(OH)O101-)
12600-79-2, Zirconium oxide (Zr2O5) 12725-92-7, Platinum oxide
(Pt2O3) 13444-71-8, Periodic acid (HIO4) 13463-67-7, Titanium
oxide (TiO2), processes 13470-24-1 13517-11-8, Hypobromous acid
13598-52-2, Phosphoroperoxoic acid 13813-62-2, Tetraphosphoric
acid 13825-81-5, Peroxydiphosphoric acid ([(HO)2P(O)]2O2)
13898-47-0, Chlorous acid 13907-45-4, Chromate (CrO42-)
13907-47-6, Chromate (Cr2O72-) 13981-20-9, Vanadate (VO31-)
14066-19-4, processes 14066-20-7, processes 14100-65-3, Borate
(BO21-) 14124-67-5, Selenite 14124-68-6, Selenate 14127-61-8,
processes 14213-97-9, Borate (BO33-) 14259-84-8 14265-44-2,
Phosphate, processes 14265-45-3, Sulfite 14280-50-3,
processes 14302-87-5, processes 14311-52-5 14332-21-9,
Hypoiodous acid 14332-31-1, Niobium hydroxide oxide (Nb(OH)O2)
14333-13-2, Permanganate (MnO41-) 14333-18-7 14333-21-2
14333-22-3 14343-69-2, Azide 14380-62-2, Hypobromite
14452-57-4, Magnesium peroxide (Mg(O2)) 14546-48-6, processes
14627-67-9, processes 14701-21-4, processes 14701-22-5,
processes 14797-55-8, Nitrate, processes 14797-65-0, Nitrite,
processes 14797-73-0, Perchlorate 14808-79-8, Sulfate, processes
14866-68-3, Chlorate 14901-63-4, Phosphite 14913-52-1, processes
14996-02-2, processes 14998-27-7, Chlorite 14998-57-3
15046-91-0, processes 15056-35-6, Periodate (IO41-) 15065-65-3,
Hypoiodite 15092-81-6, Peroxydisulfate ((SO3)2O22-) 15158-11-9,
processes 15158-12-0, processes 15391-91-0 15438-31-0,
processes 15454-31-6, Iodate (IO31-) 15541-45-4, Bromate
15543-40-5, processes 15584-04-0, Arsenate (AsO43-) 15596-54-0
15785-09-8, Cerium hydroxide (Ce(OH)3) 15845-23-5, Tellurate
(TeO42-) 15906-92-0 16065-83-1, processes 16065-84-2,
processes 16065-88-6, processes 16065-89-7, processes
16065-90-0, processes 16065-92-2, processes 16397-91-4,
processes 16408-24-5 16469-16-2, Praseodymium hydroxide
(Pr(OH)3) 16518-47-1 16637-16-4, Uranyl ion(2+) 16844-87-4
16887-00-6, Chloride, processes 18252-79-4 18282-10-5, Tin oxide
(SnO2) 18923-26-7, processes 19445-25-1, Perbromic acid
19583-16-5, Cuprate (CuO21-) 20074-52-6, processes 20334-17-2,
processes 20427-56-9 20461-54-5, Iodide, processes 20499-55-2,
Iodite (IO21-) 20561-59-5, processes 20611-56-7, Tungsten
hydroxide oxide peroxide (W(OH)2O(O2)) 20681-14-5, processes
21057-99-8, Neptunyl ion(1+) 21132-88-7 21563-95-1, Niobate
(NbO31-) 21792-06-3, Arsenenate 21879-62-9, processes
22119-26-2 22537-22-0, processes 22537-39-9, processes
22537-50-4, processes 22537-56-0, processes 22537-58-2,
processes 22541-12-4, processes 22541-14-6, processes

22541-20-4, processes 22541-25-9, processes 22541-44-2, processes 22541-46-4, processes 22541-53-3, processes 22541-58-8, processes 22541-59-9, processes 22541-60-2, processes 22541-63-5, processes 22541-64-6, processes 22541-70-4, processes 22541-88-4, processes 22542-10-5, processes 22555-00-6, processes 22569-48-8 22840-44-4, Ferrate (Fe(OH)O1-) 22853-00-5, Plutonyl ion(2+) 22878-02-0, Americyl ion(1+) 22890-32-0, Germanate (GeO32-) 22967-56-2, Plutonyl ion(1+) 23078-02-6, Niobium oxide peroxide (NbO2(O2H)) 23689-41-0 23713-49-7, processes 24573-97-5, Chromate (CrO33-) 24959-67-9, Bromide, processes 25141-14-4 26398-91-4, Borate (B2O54-) 26404-66-0, Peroxynitric acid 26450-38-4 27641-41-4, Peroxydicarbonic acid 27805-32-9 30770-97-9, Iodous acid (HIO2) 31865-44-8 34274-25-4 35366-11-1, Argentate (AgO1-) 35984-07-7, Bismuth oxide (Bi2O5)
(electrochem. mediator; mediated electrochem. oxidn. of destruction of sharps, adding enhancements such as ultrasonic energy or UV radiation)

IT 1310-58-3, Potassium hydroxide, processes 1310-73-2, Sodium hydroxide, processes 7601-54-9, Sodium **phosphate** 7631-99-4, Sodium nitrate, processes 7664-38-2, Phosphoric acid, processes 7664-93-9, Sulfuric acid, processes 7697-37-2, Nitric acid, processes 7757-79-1, Potassium nitrate, processes 7757-82-6, Sodium sulfate, processes 7778-53-2, Potassium **phosphate** 7778-80-5, Potassium sulfate, processes
(electrolyte; mediated electrochem. oxidn. of destruction of sharps, adding enhancements such as ultrasonic energy or UV radiation)

IT 7429-90-5, Aluminum, processes 7439-88-5, Iridium, processes 7439-89-6, Iron, processes 7439-92-1, Lead, processes 7439-93-2, Lithium, processes 7439-95-4, Magnesium, processes 7439-96-5, Manganese, processes 7439-97-6, Mercury, processes 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes **7440-03-1**, Niobium, processes 7440-04-2, Osmium, processes 7440-05-3, Palladium, processes **7440-06-4**, Platinum, processes 7440-09-7, Potassium, processes 7440-15-5, Rhenium, processes 7440-16-6, Rhodium, processes 7440-17-7, Rubidium, processes 7440-18-8, Ruthenium, processes 7440-20-2, Scandium, processes 7440-21-3, Silicon, processes 7440-22-4, Silver, processes 7440-23-5, Sodium, processes 7440-24-6, Strontium, processes 7440-25-7, Tantalum, processes 7440-26-8, Technetium, processes 7440-31-5, Tin, processes 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes 7440-36-0, Antimony, processes 7440-38-2, Arsenic, processes 7440-39-3, Barium, processes 7440-41-7, Beryllium, processes 7440-42-8, Boron, processes 7440-43-9, Cadmium, processes 7440-46-2, Cesium, processes 7440-47-3, Chromium, processes 7440-48-4, Cobalt, processes 7440-50-8, Copper, processes 7440-56-4, Germanium,

processes 7440-57-5, Gold, processes 7440-58-6, Hafnium, processes 7440-62-2, Vanadium, processes 7440-65-5, Yttrium, processes 7440-66-6, Zinc, processes 7440-67-7, Zirconium, processes 7440-69-9, Bismuth, processes 7440-70-2, Calcium, processes 7553-56-2, Iodine, processes 7704-34-9, Sulfur, processes 7723-14-0, Phosphorus, processes 7726-95-6, Bromine, processes 7727-37-9, Nitrogen, processes 7782-41-4, Fluorine, processes 7782-49-2, Selenium, processes 7782-50-5, Chlorine, processes 13494-80-9, Tellurium, processes
(incorporated into isopolyanion mediator; mediated electrochem. oxidn. of destruction of sharps, adding enhancements such as ultrasonic energy or UV radiation)

L82 ANSWER 9 OF 13 HCA COPYRIGHT 2006 ACS on STN
139:87890 Hermetic seals for lithium-ion **batteries**. Lasater, Brian J. (USA). U.S. Pat. Appl. Publ. US 2003134194 A1 20030717, 5 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-338369 20030108. PRIORITY: US 2002-2002/PV347218 20020109.

AB Advanced implanted medical devices require long-lived, reliable power supplies. Lithium-ion **batteries** can be used to meet this need if they can be assured of maintaining a hermetic seal while implanted. The invention is a hermetic seal for a lithium-ion **battery** where the **battery** header is made of aluminum and the pin is a conventional metal, such as platinum. The glass-to-metal seal utilizes low-temp. processable ALSG-32 glass, which has been demonstrated to bond to aluminum at temp. below the m.p. of aluminum and which has been demonstrated to exhibit excellent resistance to lithium **battery** electrolyte. ALSG-32 is a high **phosphate** glass having about 6.0% B2O3, 40.0% P2O5, 15.0% Na2O, 18.0% K2O, 9.0% PbO, and 12.0% Al2O3, expressed in mole percent.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses
(hermetic seals for lithium-ion **batteries**)

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M002-08
ICS H01M002-30
INCL 429181000; 029623400; 029623200; 174050610

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 55, 56, 57, 63
ST lithium ion **battery** hermetic seal; glass metal hermetic seal lithium ion **battery**; implant medical device lithium ion **battery** hermetic seal
IT **Phosphate** glasses
(borophosphate; hermetic seals for lithium-ion **batteries**
)
IT Seals (parts)
(hermetic seals for lithium-ion **batteries**)
IT Medical goods
(implantable; hermetic seals for lithium-ion **batteries**)
IT Secondary **batteries**
(lithium; hermetic seals for lithium-ion **batteries**)
IT Aluminum alloy, base
Copper alloy, base
Platinum alloy, base
(hermetic seals for lithium-ion **batteries**)
IT 1303-86-2, Boron oxide (B2O3), uses 1313-59-3, Sodium oxide (Na2O), uses 1314-56-3, Phosphorus oxide (P2O5), uses 1317-36-8, Lead oxide (PbO), uses 1344-28-1, Alumina, uses 12136-45-7, Potassium oxide (K2O), uses
(glass; hermetic seals for lithium-ion **batteries**)
IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-98-7, Molybdenum, uses **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-25-7, Tantalum, uses 7440-50-8, Copper, uses 11106-92-6 37186-87-1 54465-41-7, AISI400 128985-52-4, AISI 300
(hermetic seals for lithium-ion **batteries**)

L82 ANSWER 10 OF 13 HCA COPYRIGHT 2006 ACS on STN
137:283868 Synergistic combination of metal ions with an oxidizing agent and algaecide for water purification, particularly for swimming pools. Sherman, Jonathan (USA). U.S. Pat. Appl. Publ. US 2002144958 A1 20021010, 22 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-828566 20010405.
AB A water purifn. system and method suitable for suppressing bacterial, fungal and/or algae growth in swimming pools, spas, hot tubs, water storage tanks, wells and water cooling towers adds: (1) an oxidizing agent, preferably granulated or caked chlorine, (2) metal ions, preferably silver, from a **galvanic cell** having a silver anode elec. connected to a cathode made from a metal of still higher electrochem. potential, normally platinum, and, optionally (3) an algaecide, preferably chelated copper, and/or (4) a **phosphate**-reducing compd., all in synergistic combination. With use of this water purifn. system the amt. of chlorine, bromine or other chems. needed to maintain water

quality is significantly reduced to the greatly enhanced comfort of bathers and the time during which recovery can be made from an exhausted supply of oxidizing agent is usefully extended.

IT **7440-06-4**, Platinum, uses
(**galvanic cell** cathode; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-03-1**, Niobium, uses
(platinized; **galvanic cell** cathode; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

IC ICM C02F001-72
ICS C02F001-50

INCL 210758000; X21-076.4; X21-016.9; X21-019.81

CC 61-5 (Water)

IT Water purification
(biocidal; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT Algicides
Swimming pools
(oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 7440-50-8D, Copper, chelated; compds.
(algaecide; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT **7440-06-4**, Platinum, uses
(**galvanic cell** cathode; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 7782-50-5, Chlorine, biological studies

(granulated or cake; oxidizing agent; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 14701-21-4, Silver ion, processes 15158-11-9, processes 23713-49-7, Zinc ion, processes
(oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 2893-78-9 7681-52-9, Sodium hypochlorite
(oxidizing agent; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT 587-26-8, Lanthanum carbonate
(**phosphate**-removing compd.; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

IT **7440-03-1**, Niobium, uses
(platinized; **galvanic cell** cathode; oxidizing agent, algaecide, and metal ions produced by **galvanic cell** for biocidal water purifn., particularly for swimming pools)

L82 ANSWER 11 OF 13 HCA COPYRIGHT 2006 ACS on STN

136:105161 Method for preparation of thin alkali metal film member for use in **battery**. Kugai, Hirokazu; Ota, Nobuhiro; Yamanaka, Shosaku (Sumitomo Electric Industries, Ltd., Japan). Eur. Pat. Appl. EP 1174936 A2 20020123, 9 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-306241 20010719. PRIORITY: JP 2000-219071 20000719; JP 2000-382174 20001215.

AB A member having a lithium metal thin film is provided, which is extremely thin, uniform, and not degraded by air. The member includes a substrate and a thin lithium metal film formed on the substrate by a vapor deposition method. The thin film typically has a thickness of 0.1 μm to 20 μm. The substrate is typically made of a metal, an alloy, a metal oxide, or carbon. The substrate typically has a thickness of 1 μm to 100 μm. The member is used as an electrode member for a lithium cell.

IT **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses
(substrate; method for prepn. of thin alkali metal film member for use in **battery**)

RN 7440-03-1 HCA

CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M004-38
ICS H01M004-40; H01M004-02; C23C014-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** use alkali metal film prepn; lithium film prepn
battery use
IT Alloys, uses
(alkali metal; method for prepn. of thin alkali metal film member for use in **battery**)
IT Alkali metals, uses
(alloys; method for prepn. of thin alkali metal film member for use in **battery**)
IT Vapor deposition process
(ion plating; method for prepn. of thin alkali metal film member for use in **battery**)
IT Secondary **batteries**
(lithium; method for prepn. of thin alkali metal film member for use in **battery**)
IT **Battery** anodes
Films
Laser ablation
Sputtering
(method for prepn. of thin alkali metal film member for use in **battery**)
IT Alkali metals, uses
(method for prepn. of thin alkali metal film member for use in **battery**)
IT Alloys, uses
Metals, uses
Oxides (inorganic), uses
(substrate; method for prepn. of thin alkali metal film member for use in **battery**)
IT Evaporation
(vacuum; method for prepn. of thin alkali metal film member for use in **battery**)
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate 25014-41-9, Polyacrylonitrile 389119-18-0D, Lithium sulfide thiosilicate (Li0.43S0.08(SiS3)0.12), solid soln. **phosphate** contg. 389119-19-1D, Lithium sulfide thiosilicate (Li0.4S0.08(SiS3)0.13), solid soln. **phosphate** contg. 389119-20-4D, Lithium sulfide thiosilicate (Li0.41S0.06(SiS3)0.13), solid soln. **phosphate** contg.

(method for prepn. of thin alkali metal film member for use in **battery**)

IT 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses
(method for prepn. of thin alkali metal film member for use in **battery**)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7440-02-0, Nickel, uses **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses 7440-22-4, Silver, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-74-6, Indium, uses 7782-42-5, Graphite, uses 11109-50-5, Sus 304 12597-68-1, Stainless steel, uses
(substrate; method for prepn. of thin alkali metal film member for use in **battery**)

L82 ANSWER 12 OF 13 HCA COPYRIGHT 2006 ACS on STN

135:250494 Ruthenium-containing ultrasonically aerosol spray coated substrate for use in a **capacitor** and method of manufacture. Shah, Asbish; Muffoletto, Barry C. (USA). U.S. Pat. Appl. Publ. US 20010024700 A1 20010927, 22 pp., Cont.-in-part of U.S. Ser. No. 280,445. (English). CODEN: USXXCO. APPLICATION: US 2001-872110 20010601. PRIORITY: US 1997-858150 19970501; US 1999-280445 19990329.

AB A deposition process for coating a substrate with an ultrasonically generated aerosol spray, is described. The resultant droplets are much smaller in size than those produced by conventional processes, thereby providing the present coating having an increased surface area. When the coated substrate is an electrode in a **capacitor**, a greater surface area results in an increased electrode **capacitance**. A preferred coating is of a Ru-contg. oxide.

IT **7440-03-1**, Niobium, processes **7440-06-4**, Platinum, processes
(ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM B05D003-02
ICS B06B001-00
INCL 427600000
CC 76-10 (Electric Phenomena)
ST ruthenium oxide ultrasonic aerosol spray coating **capacitor** electrode
IT Sprays
(aerosols; ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)
IT Cleaning
Etching
(plasma; ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)
IT Blasting
Capacitor electrodes
Sound and Ultrasound
(ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)
IT Metals, processes
(ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)
IT Coating process
(ultrasonic aerosol spray; ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)
IT 11113-84-1, Ruthenium oxide
(ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)
IT 7697-37-2, Nitric acid, processes 10049-08-8, Ruthenium chloride 13826-69-2, Ruthenium nitrate 34513-98-9, Ruthenium nitrosyl nitrate 41860-99-5, Ruthenium sulfate 58371-05-4, Ruthenium **phosphate**
(ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)
IT 7439-88-5, Iridium, processes 7439-89-6, Iron, processes 7439-96-5, Manganese, processes 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes **7440-03-1**, Niobium, processes 7440-04-2, Osmium, processes 7440-05-3, Palladium, processes **7440-06-4**, Platinum, processes 7440-16-6, Rhodium, processes 7440-18-8, Ruthenium, processes 7440-22-4, Silver, processes 7440-25-7, Tantalum, processes 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes 7440-48-4, Cobalt, processes 7440-57-5, Gold, processes 7440-58-6, Hafnium, processes 7440-62-2, Vanadium, processes 7440-67-7, Zirconium, processes
(ruthenium-contg. ultrasonically aerosol spray coated substrate for use in **capacitor** and method of manuf.)

L82 ANSWER 13 OF 13 HCA
120:305902 Manufacture of composites, especially dissimilar fiber-reinforced products. Tatarchuk, Bruce J.; Rose, Millard F.; Krishnagopalan, Gopal A.; Zabasajja, John N.; Kohler, David A. (Auburn University, USA). U.S. US 5304330 A 19940419, 26 pp. Cont-in-part of U.S. 356,861. (English). CODEN: USXXAM. APPLICATION: US 1991-748032 19910821. PRIORITY: US 1989-356861 19890524; US 1989-435167 19891113.

AB The process comprises forming a dispersion of carbon fibers, metal fibers, and cellulose in an unreactive liq., removing the liq. from the dispersion, heating the resulting dried preforms in a H-contg. atm. at a temp. effective to volatilize ≥90 wt.% of the cellulose and fuse the fibers with a loss of .ltorsim.25 wt.% of the carbon fibers, and recovering the composites. The dispersion of the dissimilar fibers may contain ≥1 structure-forming agents selected from cellulose, poly(vinyl alc.), polyurethanes, butadiene-styrene latex, epoxy resins, H2CO-urea resins, and polyamide-polyamine epichlorohydrin resins. The composites may contain fibers of C, Al2O3, ceramics, and aluminosilicates, interwined in a network of fused metal fibers. The composites are manufd. to have varying surface area, void vol., and pore size, while maintaining high elec. cond., and are esp. suitable for use as reinforced C electrodes in **batteries** and **fuel cells**.

IT **7440-03-1P**, Niobium, uses **7440-06-4P**, Platinum, uses
(fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM C04B035-64
INCL 264061000
CC 57-6 (Ceramics)
Section cross-reference(s): 52
IT Metallic fibers
(Carpenter alloys, dispersions contg. cellulose and carbon fibers

and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(aluminophosphate, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(aluminosilicophosphate, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Electrodes
(carbon carbon fiber- and metallic fiber-reinforced, manuf. of, for **batteries** and **fuel cells**)

IT Epoxy resins, uses
Urethane polymers, uses
(dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Carbon fibers, uses
(dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Rubber, butadiene-styrene, uses
(latex, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT **Phosphates**, uses
(alumino-, fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT **Phosphates**, uses
(aluminosilico-, fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers

(aluminum, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(aluminum oxide, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(aluminum silicate, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(antimony, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(beryllium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(cadmium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(ceramic, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(chromium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(cobalt, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(constantan, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel**

cells)

IT Metallic fibers
(copper, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Ceramic materials and wares
(fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(gallium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(gold, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(hafnium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(hastelloy, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(inconel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(indium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(iridium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(iron, dispersions contg. cellulose and carbon fibers and, drying

and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(iron alloy, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(magnesium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(magnesium oxide, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(manganese, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(molybdenum, fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(monel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(nichrome, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(nickel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(niobium, fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(osmium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(palladium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(platinum, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Polyamines
(polyamide-, epoxidized, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Polyamides, compounds
(polyamine-, epoxidized, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(rhenium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(rhodium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(ruthenium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(silica, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(silicon, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite

manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(silver, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(steel, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(tantalum, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(tin, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(titanium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Synthetic fibers
(titanium oxide, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(tungsten, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(vanadium, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers
(zinc, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Metallic fibers

(zirconium, fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT Iron alloy, base
(fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 1333-74-0, Hydrogen, uses
(atms. contg., sintering in, in carbon fiber- and metal fiber-reinforced carbon composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 7440-44-0P
(carbon fibers, dispersions contg. cellulose and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 9002-89-5P, Poly(vinyl alcohol) 9004-34-6P, Cellulose, uses 9011-05-6P, Formaldehyde-urea polymer
(dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 7429-90-5P, Aluminum, uses 7439-88-5P, Iridium, uses 7439-89-6P, Iron, uses 7439-95-4P, Magnesium, uses 7439-96-5P, Manganese, uses 7439-98-7P, Molybdenum, uses 7440-02-0P, Nickel, uses **7440-03-1P**, Niobium, uses 7440-04-2P, Osmium, uses 7440-05-3P, Palladium, uses **7440-06-4P**, Platinum, uses 7440-15-5P, Rhenium, uses 7440-16-6P, Rhodium, uses 7440-18-8P, Ruthenium, uses 7440-21-3P, Silicon, uses 7440-22-4P, Silver, uses 7440-25-7P, Tantalum, uses 7440-31-5P, Tin, uses 7440-32-6P, Titanium, uses 7440-33-7P, Tungsten, uses 7440-36-0P, Antimony, uses 7440-41-7P, Beryllium, uses 7440-43-9P, Cadmium, uses 7440-47-3P, Chromium, uses 7440-48-4P, Cobalt, uses 7440-50-8P, Copper, uses 7440-55-3P, Gallium, uses 7440-57-5P, Gold, uses 7440-58-6P, Hafnium, uses 7440-62-2P, Vanadium, uses 7440-66-6P, Zinc, uses 7440-67-7P, Zirconium, uses 7440-74-6P, Indium, uses 11105-19-4P, Monel 12597-69-2P, Steel, miscellaneous 12605-70-8P, Nichrome 12605-79-7P, Constantan 12606-02-9P, Inconel 37286-21-8P, Hastelloy
(fibers, dispersions contg. cellulose and carbon fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 1309-48-4P, Magnesia, uses 1344-28-1P, Alumina, uses 7631-86-9P, Silica, uses 13463-67-7P, Titania, uses
(fibers, dispersions contg. cellulose and metallic fibers and,

drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

IT 9003-55-8P

(rubber, latex, dispersions contg. carbon fibers and metallic fibers and, drying and sintering of, in dissimilar fiber-reinforced composite manuf. for electrodes for **batteries** and **fuel cells**)

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USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
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=> display history full l1-

     FILE 'LREGISTRY' ENTERED AT 11:09:53 ON 17 OCT 2006
L1          235 SEA (P (L) O (L) (PT OR PD OR RU OR IR OR OS OR RE))/ELS
L2            2 SEA L1 NOT ((C OR N OR AS OR SB OR BI OR S OR SE OR TE
                OR PO)/ELS OR (A1 OR A2 OR LNTH OR ACTN OR A3 OR A4 OR
                A7 OR A8)/PG)
L3            0 SEA L2 AND 4/ELC.SUB NOT H/ELS
L4            0 SEA L2 AND 5/ELC.SUB AND H/ELS

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L6          212 SEA L5 NOT ((C OR N OR AS OR SB OR BI OR S OR SE OR TE
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L7           36 SEA L6 AND 4/ELC.SUB NOT H/ELS
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L13         119 SEA (FUEL? OR HYDROGEN# OR H2 OR "H" OR STORE# OR
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L14         182 SEA CAPACIT!R? OR CAPACITANC?
L15         436 SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
                OR GALVANI? OR PRIMARY OR SECONDARY OR WET OR DRY)(2A)(CE
                LL OR CELLS) OR WETCELL? OR DRYCELL?

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L17      116108 SEA CAPACIT!R? OR CAPACITANC?
L18      227250 SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
                OR GALVANI? OR PRIMARY OR SECONDARY OR WET OR DRY)(2A)(CE
                LL OR CELLS) OR WETCELL? OR DRYCELL?
L19           1 SEA L11 AND (L16 OR L17 OR L18)
L20           0 SEA L12 AND (L16 OR L17 OR L18)
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L21            34 SEA (L11 OR L12) NOT L19
L22            32 SEA L21 AND 1840-2003/PY,PRY
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L19 ANSWER 1 OF 1 HCA COPYRIGHT 2006 ACS on STN

142:77583 **Fuel cell** with liquid **fuel** and liquid peroxide oxidant and procedures for the production and regeneration of fuel and oxidant. Buttkewitz, Gerhard; Foge, Detlef; Schmuhl, Andreas; Jeroschewski, Paul (AMT Analysenmesstechnik G.m.b.H., Germany; ATI Kueste G.m.b.H.). Ger. Offen. DE 10324200 A1 20041223, 10 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2003-10324200 20030528.

AB The invention concerns a **fuel cell** with liq. **fuel** and liq. peroxide oxidant as as well as chem. and/or electrochem. procedures for the prodn. and/or regeneration of fuel and oxidant. It refers esp. to **fuel cells**, which are fabricated pressure-neutrally and to the optimization of fuel-oxidant combinations using special catalyst materials with low ambient temps. In a special construction of the invention, fuel and/or oxidant are produced chem. or electrochem. from carriers or from the reaction products of the **fuel cell**. The **fuel cell** according to invention can be inserted with priority in the underwater region or used in totally enclosed systems, in addn., under normal conditions for power supply.

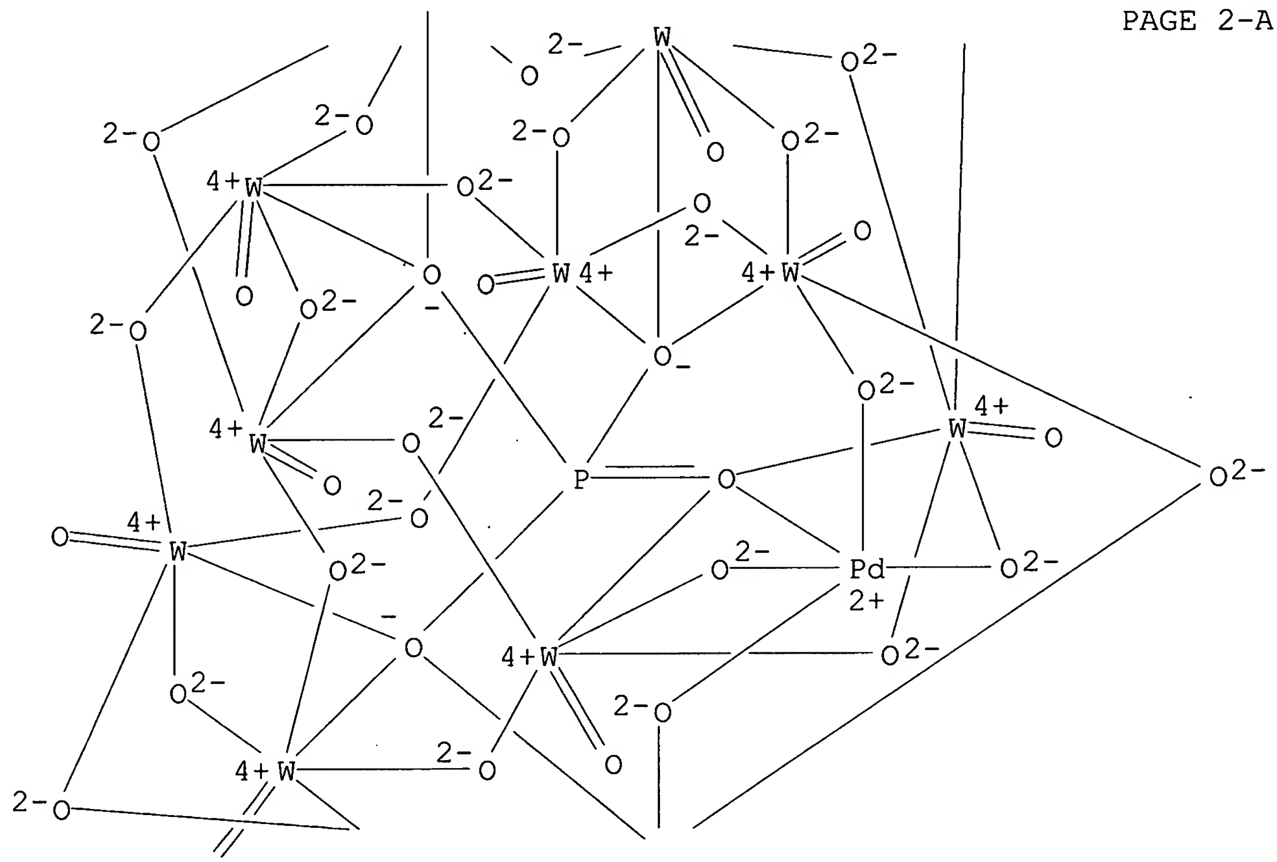
IT **123183-24-4 812693-20-2**
(**fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)

RN 123183-24-4 HCA

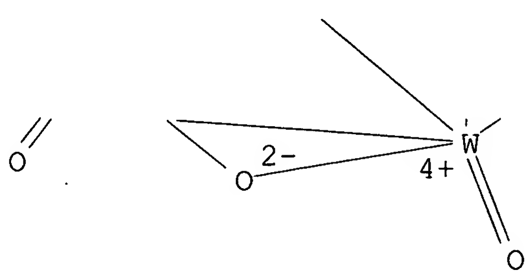
CN Tungstate(5-), tetracosa-μ-oxoundecaoxopalladate[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':.kappa .O':κO'':κO'':κO'':κO''':κO''':κ O''']]undeca- (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A

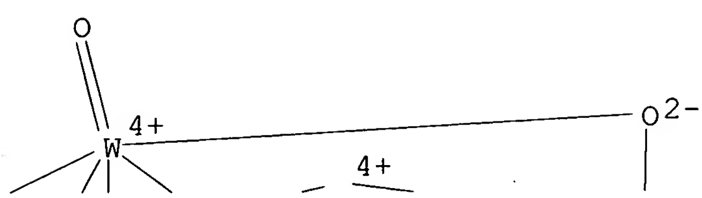


PAGE 3-A

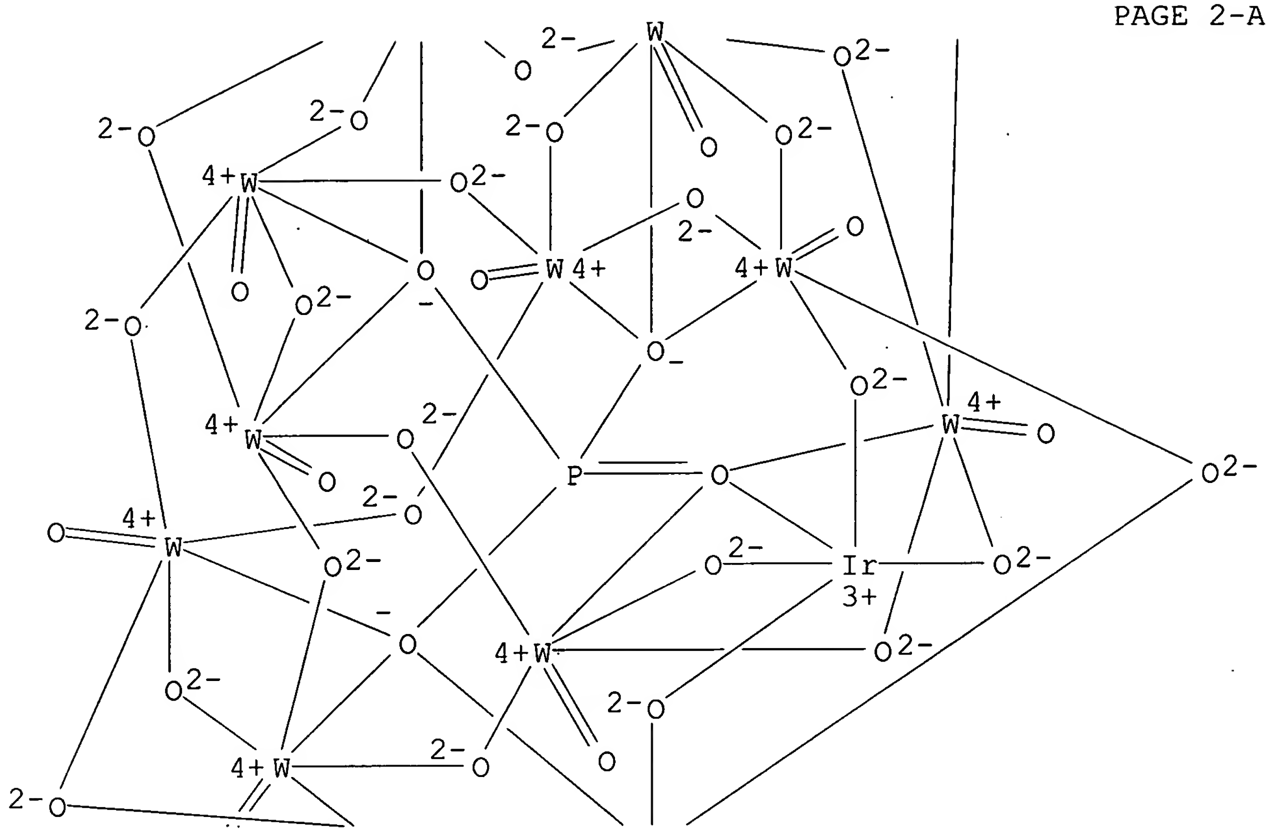


RN 812693-20-2 HCA
CN Tungstate(4-), iridatetetracosa-μ-oxoundecaoxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':.kappa .O':κO'':κO'':κO'':κO''':κO''':κ O''']]undeca- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



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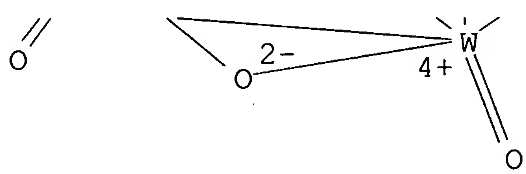


IC ICM H01M008-22
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 67
ST **fuel cell** liq **fuel** liq peroxide oxidant
IT Cyclic compounds
(annulenes, tetraaza; **fuel cell** with liq. **fuel** and liq. peroxide oxidant and procedures for prodn. and regeneration of fuel and oxidant)
IT Reduction catalysts

(**electrochem.**; **fuel cell** with liq.
fuel and liq. peroxide oxidant and procedures for prodn.
and regeneration of fuel and oxidant)
IT Polyoxyalkylenes, uses
(fluorine- and sulfo-contg., ionomers; **fuel**
cell with liq. **fuel** and liq. peroxide oxidant
and procedures for prodn. and regeneration of fuel and oxidant)
IT **Fuel cells**
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)
IT Porphyrins
Quinones
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)
IT Alcohols, uses
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)
IT Aldehydes, uses
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)
IT **Fuels**
Oxidizing agents
(liq.; **fuel cell** with liq. **fuel** and
liq. peroxide oxidant and procedures for prodn. and regeneration
of fuel and oxidant)
IT Peroxides, processes
(liq.; **fuel cell** with liq. **fuel** and
liq. peroxide oxidant and procedures for prodn. and regeneration
of fuel and oxidant)
IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-contg., ionomers; **fuel**
cell with liq. **fuel** and liq. peroxide oxidant
and procedures for prodn. and regeneration of fuel and oxidant)
IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-contg.; **fuel**
cell with liq. **fuel** and liq. peroxide oxidant
and procedures for prodn. and regeneration of fuel and oxidant)
IT 574-93-6, Phthalocyanine 1313-27-5, Molybdenum oxide (MoO_3), uses
1314-23-4, Zirconia, uses 1314-35-8, Tungsten oxide (WO_3), uses
7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7440-02-0,
Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum,
uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses
7440-44-0, Carbon, uses 7440-48-4, Cobalt, uses 7440-50-8,
Copper, uses 11104-61-3, Cobalt oxide 11129-60-5, Manganese

oxide 12070-13-2, Tungsten carbide (W2C) 12610-90-1
13463-67-7, Titania, uses 13762-14-6, Cobalt molybdenum oxide
(CoMoO4) 14167-12-5 14167-18-1, Cobalt salen 14167-20-5,
Nickel(II) salen 25265-76-3, Phenylenediamine 28903-71-1
37373-34-5 53218-63-6 55940-93-7 106354-33-0
123183-24-4 123183-36-8 812665-46-6, Antimony iridium
oxide (SbIrO4) 812665-52-4, Antimony titanium oxide (SbTiO4)
812692-85-6 **812693-20-2** 812693-21-3 812693-22-4
812693-23-5 812693-26-8 812693-27-9 812693-30-4 812693-31-5
812693-32-6 812693-36-0 812693-37-1 812693-38-2 812693-39-3
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)

IT 7722-84-1, Hydrogen peroxide, processes
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)

IT 77950-55-1, Nafion 115
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)

IT 64-18-6, Formic acid, uses
(**fuel cell** with liq. **fuel** and liq.
peroxide oxidant and procedures for prodn. and regeneration of
fuel and oxidant)

=> d l22 1-32 ti

L22 ANSWER 1 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Crystal structure and ionic conductivity of ruthenium diphosphate
ARu2(P2O7)2, A=Li, Na, and Ag, with a tunnel structure

L22 ANSWER 2 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Synthesis of methyl acetate from dimethyl ether using Group VIII
metal salts of phosphotungstic acid

L22 ANSWER 3 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Active metal species assembled with heteropoly tungstate anion
PW9O349- for liquid phase hydrocarbon oxidation

L22 ANSWER 4 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Wear-resistant titanium alloys for prosthetics

L22 ANSWER 5 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Synthesis and characterization of ReV, ReVI and ReVII complexes of
the [α2-P2W17O61]10- isomer

L22 ANSWER 6 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Formation of the heteropoly anion [Pd4(PW9O34)2]10- in solution

L22 ANSWER 7 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI O2/H2 oxidation of hydrocarbons on the catalysts prepared from Pd(II) complexes with heteropolytungstates

L22 ANSWER 8 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Mechanisms of oxidant activation in alkene epoxidation catalyzed by monosubstituted heteropolytungstates

L22 ANSWER 9 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI The study of acid-catalyzed mechanism of palladium 12-tungstophosphorate

L22 ANSWER 10 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Complexes of palladium(II) and platinum(II) with the PW11O397- heteropolyanion as catalytically active species in benzene oxidation

L22 ANSWER 11 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Ruthenium complexes with heteropoly anion PW11O377- and their redox properties

L22 ANSWER 12 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Palladium salts of heteropolyacids as catalysts in the Wacker oxidation of 1-butene

L22 ANSWER 13 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Heteropolyanions as redox components in heterogeneous Wacker oxidation catalysts

L22 ANSWER 14 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Coordination, electron transfer and catalytic chemistry of a ruthenium-substituted heteropolytungstate anion as revealed in its electrochemical behavior

L22 ANSWER 15 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Stilbene epoxidation with t-butyl hydroperoxide and hydrogen peroxide catalyzed by transition metal substituted heteropolytungstates

L22 ANSWER 16 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Vapor phase carbonylation of methanol or dimethyl ether with metal-ion exchanged heteropoly acid catalysts

L22 ANSWER 17 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Preparation of ethyl acetate by catalytic oxidation of ethanol

L22 ANSWER 18 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Preparation of acetic acid by oxidation of ethylene

L22 ANSWER 19 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Lacunary polyoxometalate anions are π-acceptor ligands. Characterization of some tungstoruthenate(II,III,IV,V) heteropolyanions and their atom-transfer reactivity

L22 ANSWER 20 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Catalysts for carbonylation of alcohols

L22 ANSWER 21 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Vibrational spectroscopic study of the interaction of tungstophosphate (PW11O397-) heteropoly anion with metal ions

L22 ANSWER 22 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Redox properties of heteropolyacids of the type H3+x[PVxMo12-xO40] and their salts: effect of palladium and platinum

L22 ANSWER 23 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Polyoxotungstate anions containing high-valent rhenium. 1. Keggin anion derivatives

L22 ANSWER 24 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Isomerization of alkanes over a palladium salt of a heteropoly acid

L22 ANSWER 25 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI A kinetic study of the oxidation of methanol over molybdate catalysts

L22 ANSWER 26 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI 12-Heteropolymolybdates as catalysts for vapor-phase oxidative dehydrogenation of isobutyric acid. 2. Group IB, IIB, IIIA, and VIII metal salts

L22 ANSWER 27 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI X-ray photoelectron spectroscopy, x-ray Auger electron spectroscopy, and electron spin resonance studies of the reduction of some solid metal 12-molybdophosphates

L22 ANSWER 28 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Effects of cations introduced into 12-molybdophosphoric acid on the catalyst properties

L22 ANSWER 29 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Catalytic behavior of heteropoly compounds. 3. Physical and acid-catalytic properties of 12-molybdophosphates

L22 ANSWER 30 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Magnetic materials

L22 ANSWER 31 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Synthesis of heteropoly anions in aprotic solvents. Tungstorhenates(V),-(VI), and -(VII)

L22 ANSWER 32 OF 32 HCA COPYRIGHT 2006 ACS on STN
TI Reaction of the chlororhenate(IV) ion with various tungstic polyanions

=> d l22 3,7,14 cbib abs hitstr hitind

L22 ANSWER 3 OF 32 HCA COPYRIGHT 2006 ACS on STN
133:340898 Active metal species assembled with heteropoly tungstate anion PW9O349- for liquid phase hydrocarbon oxidation. Kuznetsova, L. I.; Kuznetsova, N. I.; Detusheva, L. G.; Fedotov, M. A.; Likholobov, V. A. (Boreskov Institute of Catalysis, Novosibirsk, 630090, Russia). Journal of Molecular Catalysis A: Chemical, 158(1), 429-433 (English) **2000**. CODEN: JMCCF2. ISSN: 1381-1169. Publisher: Elsevier Science B.V..

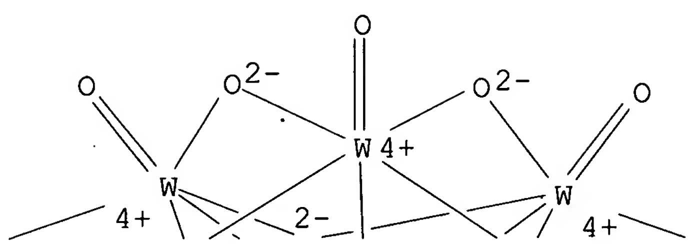
AB Monometallic [Pd3(PW9O34)2]12-, [Pd3(PW9O34)2PdnOxHy]q- (where on the av. n=3), bimetallic [Pd2Cu(PW9O34)2]12-, [Pd2Fe(PW9O34)2]11-, [PdFe2(PW9O34)2]10- and a mixt. of [Pd3(PW9O34)2PdnOxHy]q- (nav≈10)+[(VO)3(PW9O34)2]9- complexes were prepd. and characterized by NMR 31P, 183W, 51V and IR spectroscopy. The complexes were tested in catalysis of O2+H2 reaction and benzene oxidn. to phenol with O2/H2. Effectiveness of the catalytic performance depended on the compn. of the complexes. Bimetallic Pd(II)-Fe(III) complexes were several times more active in phenol prodn. than Pd(II) monometallic systems.

IT **203575-21-7D**, reaction products with tetraaquapalladium(2+)
(active metal species assembled with heteropoly tungstate anion PW9O349- for liq. phase hydrocarbon oxidn.)

RN 203575-21-7 HCA

CN Tungstate(12-), dotetraconta-μ-oxooctadecaoxotripalladatebis[μ 9-[phosphato(3-)-κO:κO:κO:κO':κO':.kap pa.O'':κO'':κO''':κO''']]octadeca- (9CI) (CA INDEX NAME)

PAGE 1-A



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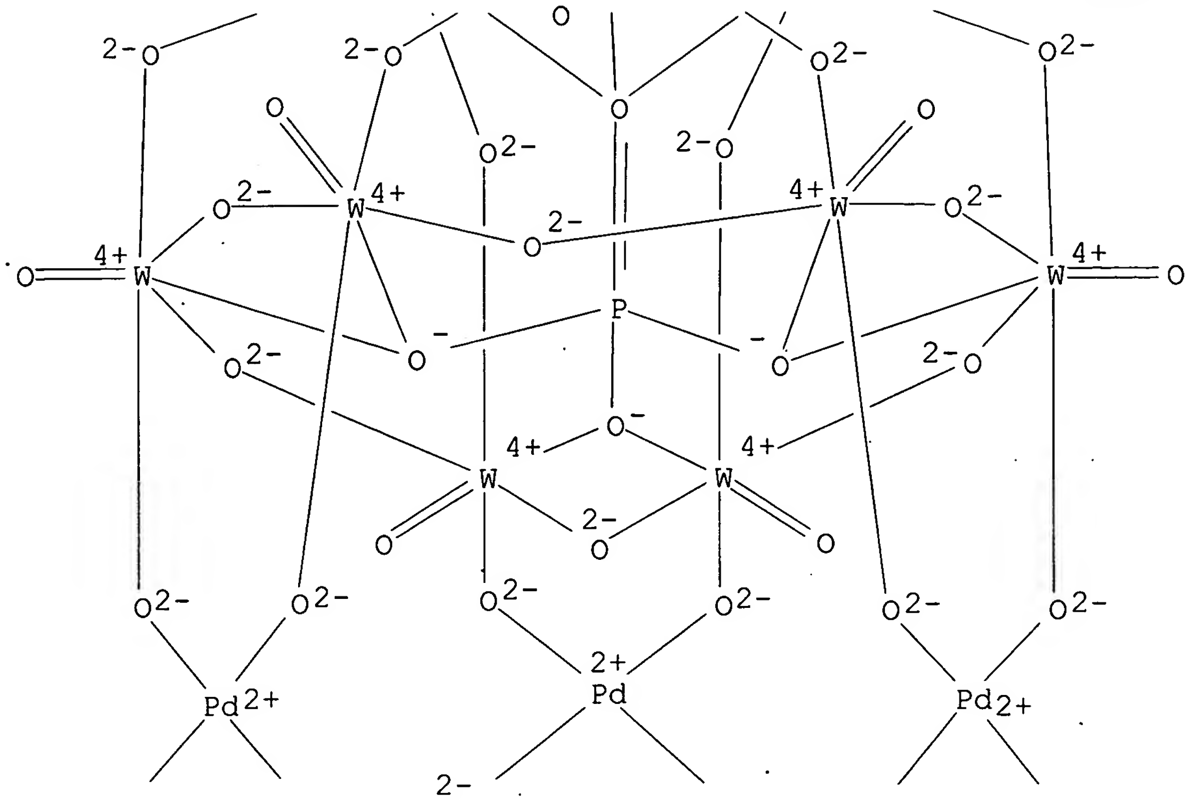
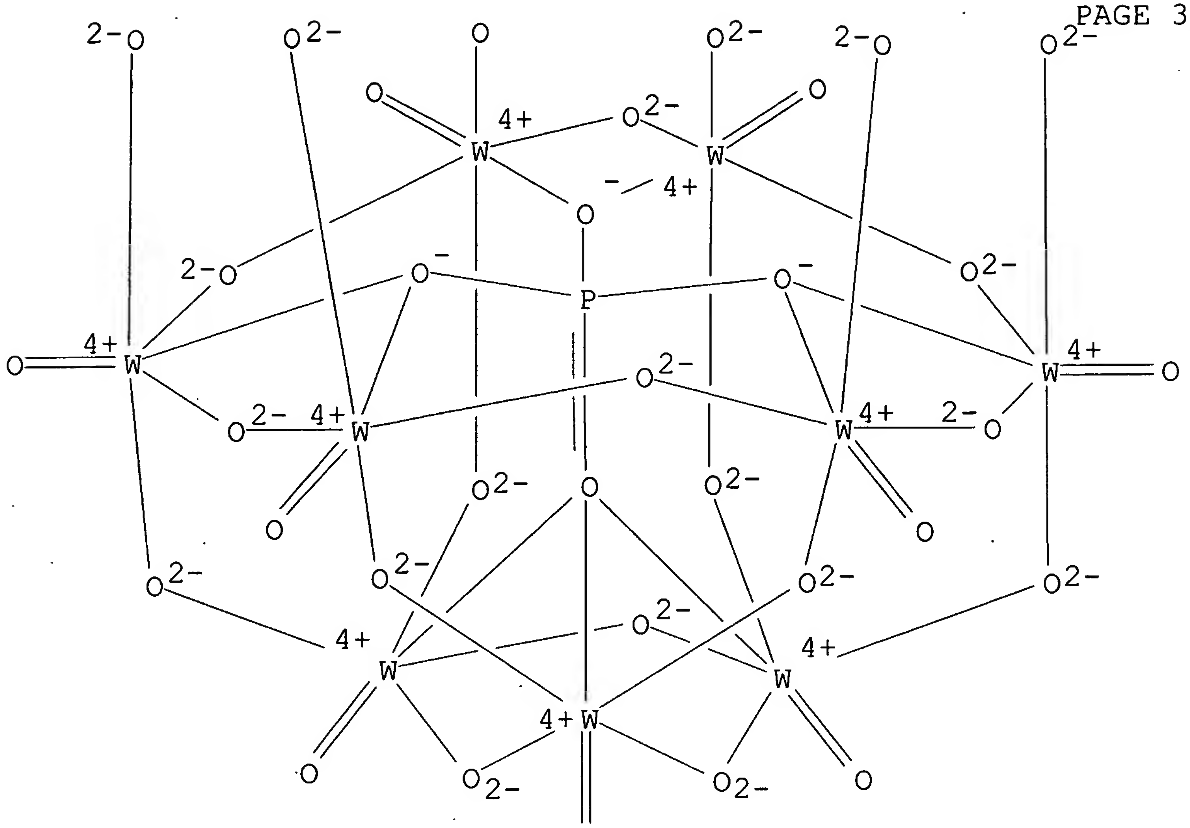


PAGE 3-A



PAGE 4-A

O

(active metal species assembled with heteropoly tungstate anion PW9O349- for liq. phase hydrocarbon oxidn.

CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 25

IT 22573-07-5D, reaction products with [Pd3(PW9O34)2]12-
203575-21-7D, reaction products with tetraaquapalladium(2+)
(active metal species assembled with heteropoly tungstate anion PW9O349- for liq. phase hydrocarbon oxidn.)

IT **203575-21-7P** 304678-18-0P 304678-20-4P 304678-23-7P 304678-24-8P
(active metal species assembled with heteropoly tungstate anion PW9O349- for liq. phase hydrocarbon oxidn.)

L22 ANSWER 7 OF 32 HCA COPYRIGHT 2006 ACS on STN

128:197194 O2/H2 oxidation of hydrocarbons on the catalysts prepared from Pd(II) complexes with heteropolytungstates. Kuznetsova, N. I.; Kuznetsova, L. I.; Detusheva, L. G.; Likholobov, V. A.; Fedotov, M. A.; Koscheev, S. V.; Burgina, E. B. (Boreskov Institute of Catalysis, Novosibirsk, 630090, Russia). Studies in Surface Science and Catalysis, 110(3rd World Congress on Oxidation Catalysis, 1997), 1203-1211 (English) **1997**. CODEN: SSCTDM. ISSN: 0167-2991. Publisher: Elsevier Science B.V..

AB Palladium(II) complexes with heteropolyanions PW11O397- and PW9O349-, and originally synthesized bimetallic Pd(II)-Fe(III) complexes with PW9O349- were used for the prepn. of SiO2 supported catalysts of hydrocarbons oxidn. The compn. of the complexes in aq. soln. was characterized by 31P NMR and IR spectroscopy. The supported samples prepd. from Pd(II) complexes with the PW11O397- anion exhibited a considerable activity in a liq.-phase oxidn. of benzene and cyclohexane with a gas mixt. of O2/H2. H2 pretreatment of the catalysts gave rise to increasing the yield of oxygen contg. org. products. It was witnessed by XPS and IR studies that heteropolytungstate principally retained its structure and a part of Pd(II) ions became reduced to Pd(0) after supporting and H2 treating the samples at a temp. of 100°C. Decompn. of the heteropolytungstate proceeded at a temp. of 450°C resulting in a loss of catalytic properties of the sample. The samples prepd. from Pd(II) complexes with another heteropolytungstate PW9O349- anion showed poor catalytic activity in oxidn. of hydrocarbons. By contrast, bimetal Pd(II)-Fe(III) complexes with the same anion gave active catalysts after supporting and H2 treatment. The specific interaction of palladium species with PW11O397- or Fe(III) in the complexes with heteropolytungstates det. the catalytic properties of the supported samples.

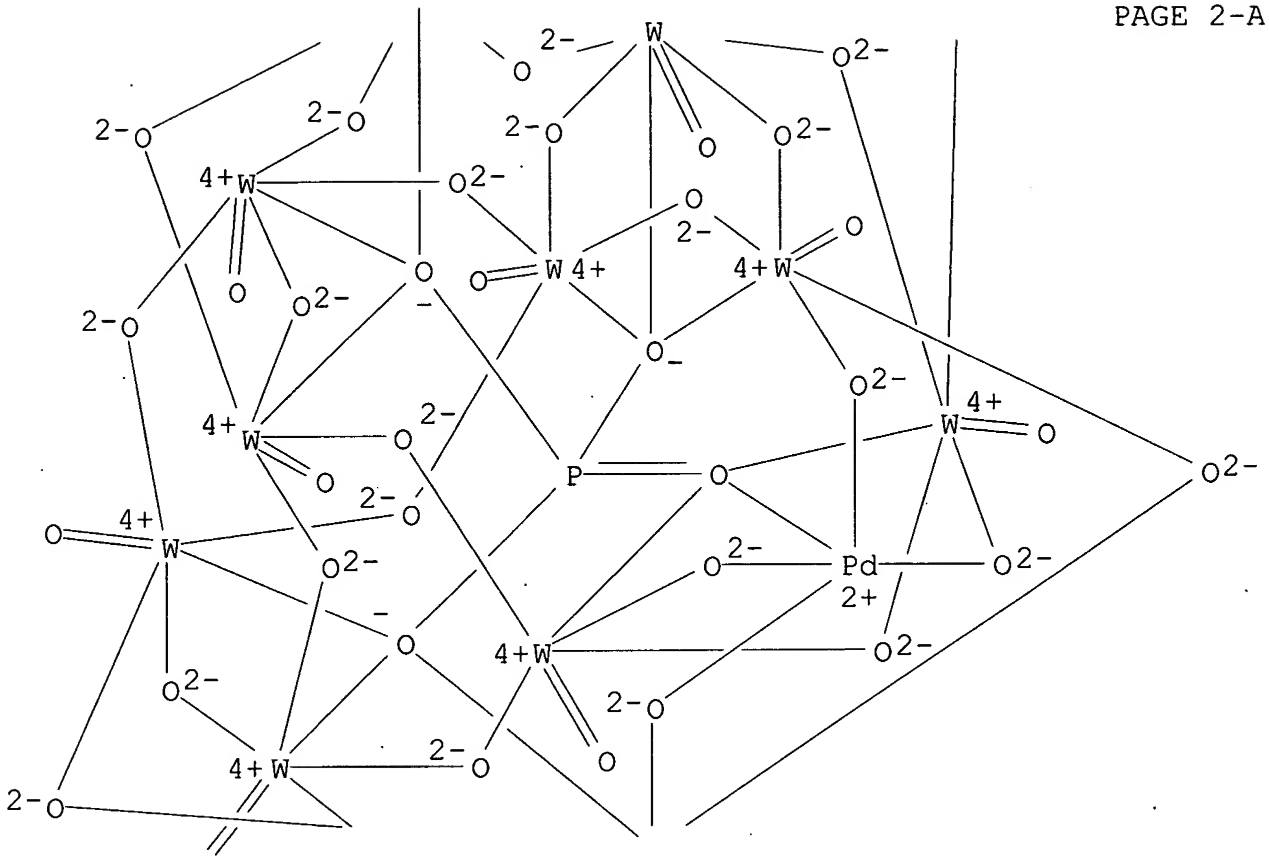
IT **123183-24-4 185752-14-1 203575-21-7**
(O2/H2 oxidn. of hydrocarbons on catalysts prepd. from Pd(II) complexes with heteropolytungstates)

RN 123183-24-4 HCA

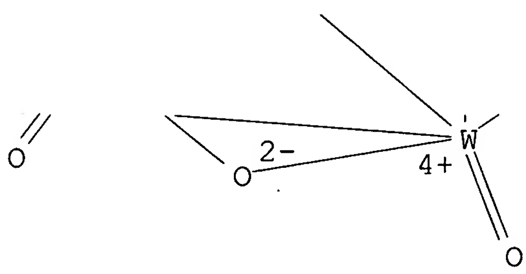
CN Tungstate(5-), tetracosa-μ-oxoundecaoxopalladate[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':.kappa.O':κO'':κO'':κO'':κO''':κO''':κO''']]undeca- (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



PAGE 3-A

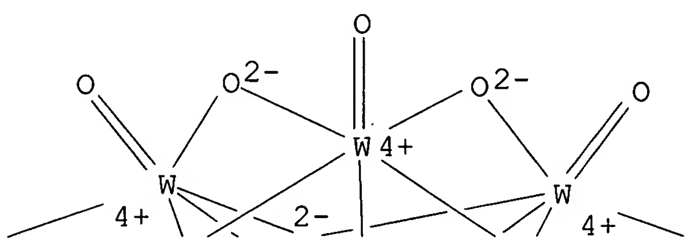


RN 185752-14-1 HCA
CN Tungstate(12-), octatetraconta-μ-oxodocosaoxo(μ-oxodipalladate)bis[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':κO''']]docosa- (9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

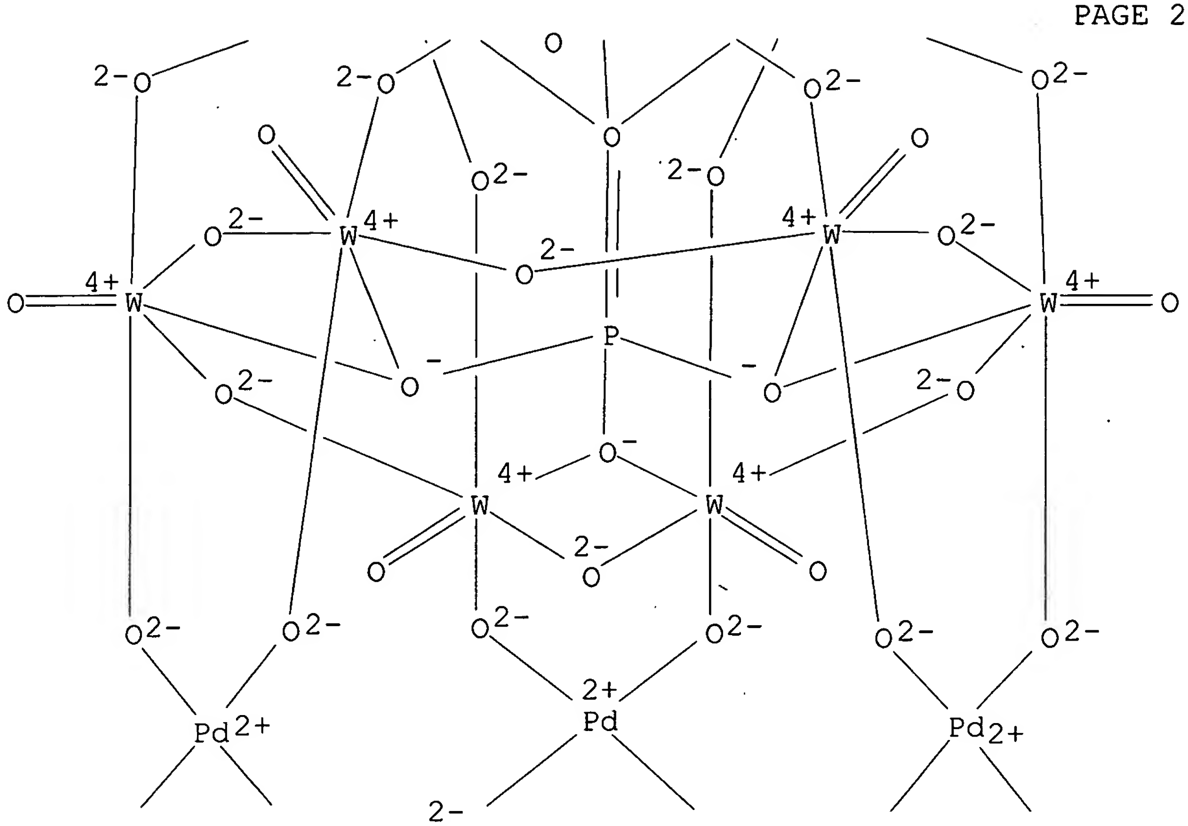
RN 203575-21-7 HCA

CN Tungstate(12-), dotetraconta-μ-oxooctadecaoxotripalladatebis[μ 9-[phosphato(3-)-κO:κO:κO:κO':κO':.kap pa.O'':κO'':κO''':κO''']]octadeca- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



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W4+
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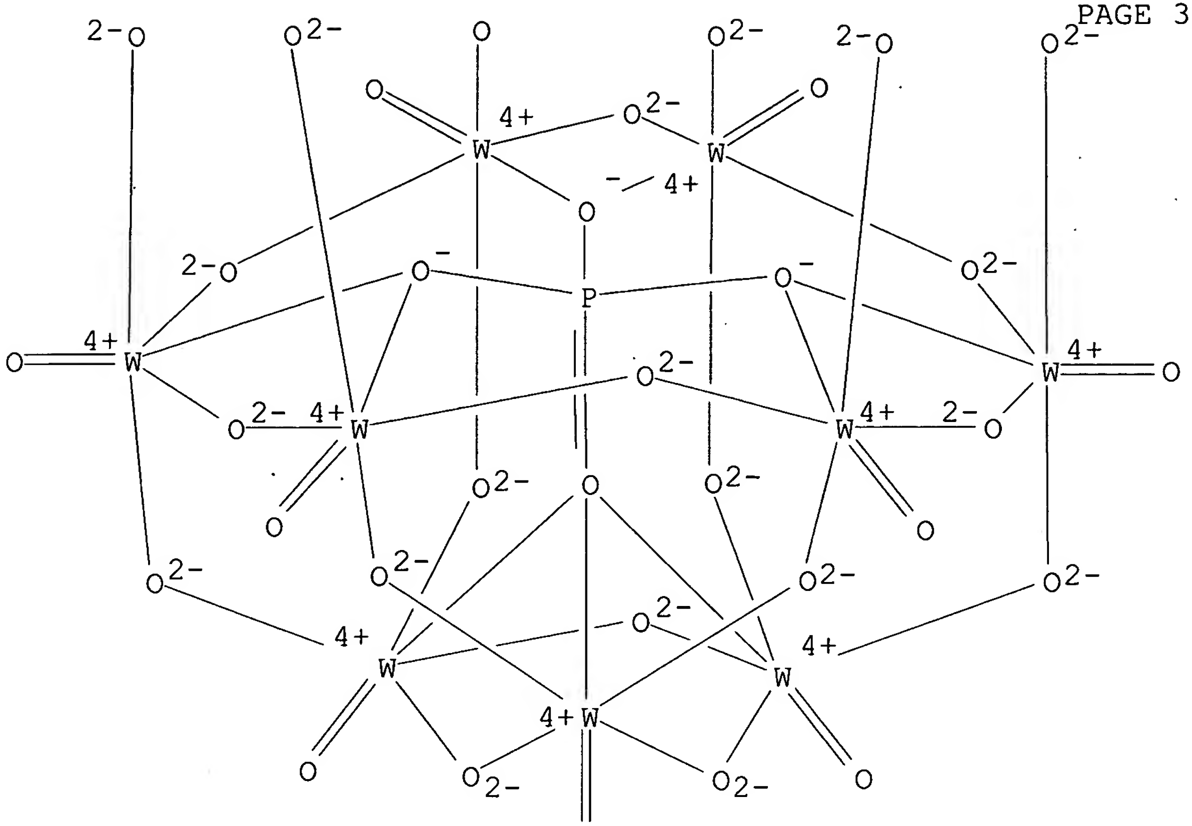
Pd2+
2-

PAGE 3-A



PAGE 4-A

CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 24, 25
IT 7439-89-6D, Iron, iron palladium tungstophosphate complex, uses
7440-05-3D, Palladium, palladium tungstophosphate complex, uses
123183-24-4 **185752-14-1** 203575-19-3
203575-21-7 203575-23-9 203575-25-1
(O2/H2 oxidn. of hydrocarbons on catalysts prepd. from Pd(II) complexes with heteropolytungstates)

L22 ANSWER 14 OF 32 HCA
123:95910 Coordination, electron transfer and catalytic chemistry of a ruthenium-substituted heteropolytungstate anion as revealed in its electrochemical behavior. Bart, John C.; Anson, Fred C. (Arthur

Amos Noyes Laboratories, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, 91125, USA). Journal of Electroanalytical Chemistry, 390(1-2), 11-19 (English) **1995**. CODEN: JECHES. ISSN: 0368-1874. Publisher: Elsevier.

AB The rates of substitution of π-acidic ligands for the aqua ligand in the Ru-substituted heteropolytungstate anion (H2O)RuIIPW11O395- were measured and compared with those of more familiar complexes of Ru(II). The weakly π-acidic character of the heteropolytungstate anionic ligand produced a decrease in the lability of the aqua ligand. The kinetics of homogeneous electron transfer reactions involving the (H2O)RuIIPW11O395- anion were complicated by its high charge and tendency to ppt. with cationic oxidants. However, the specific rate of its redn. of O2 to H2O2 was in good agreement with the value calcd. from the Marcus relation. The RuIIIOH2 center in (H2O)RuIIIPW11O394- is reversibly oxidizable in two steps to RuIV:O and RuV:O. The RuV:O complex oxidizes benzyl alc., MeOH and iso-PrOH, but the reaction rates are too small to make the complex attractive as an oxidn. catalyst.

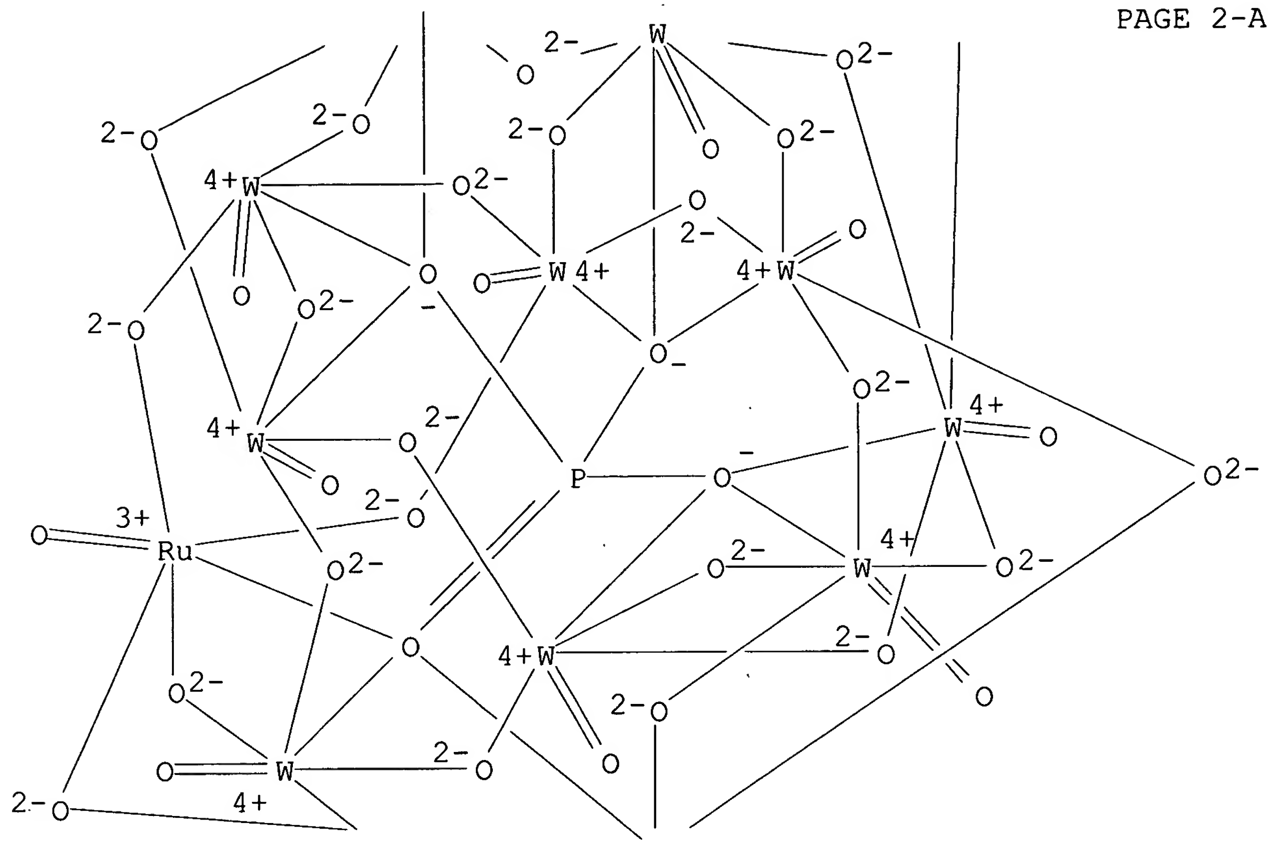
IT **139657-74-2 139657-75-3**
(electrochem. and catalytic properties of)

RN 139657-74-2 HCA

CN Tungstate(4-), tetracosa-μ-oxoundecaoxo(oxoruthenate)[μ12-[phosphato(3-)-O:O:O:O':O':O':O'':O'':O'':O''':O''':O''']]undeca- (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



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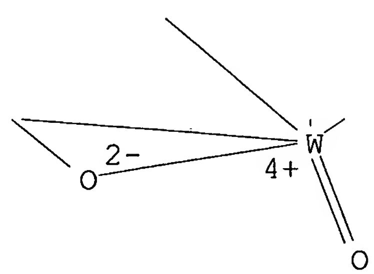
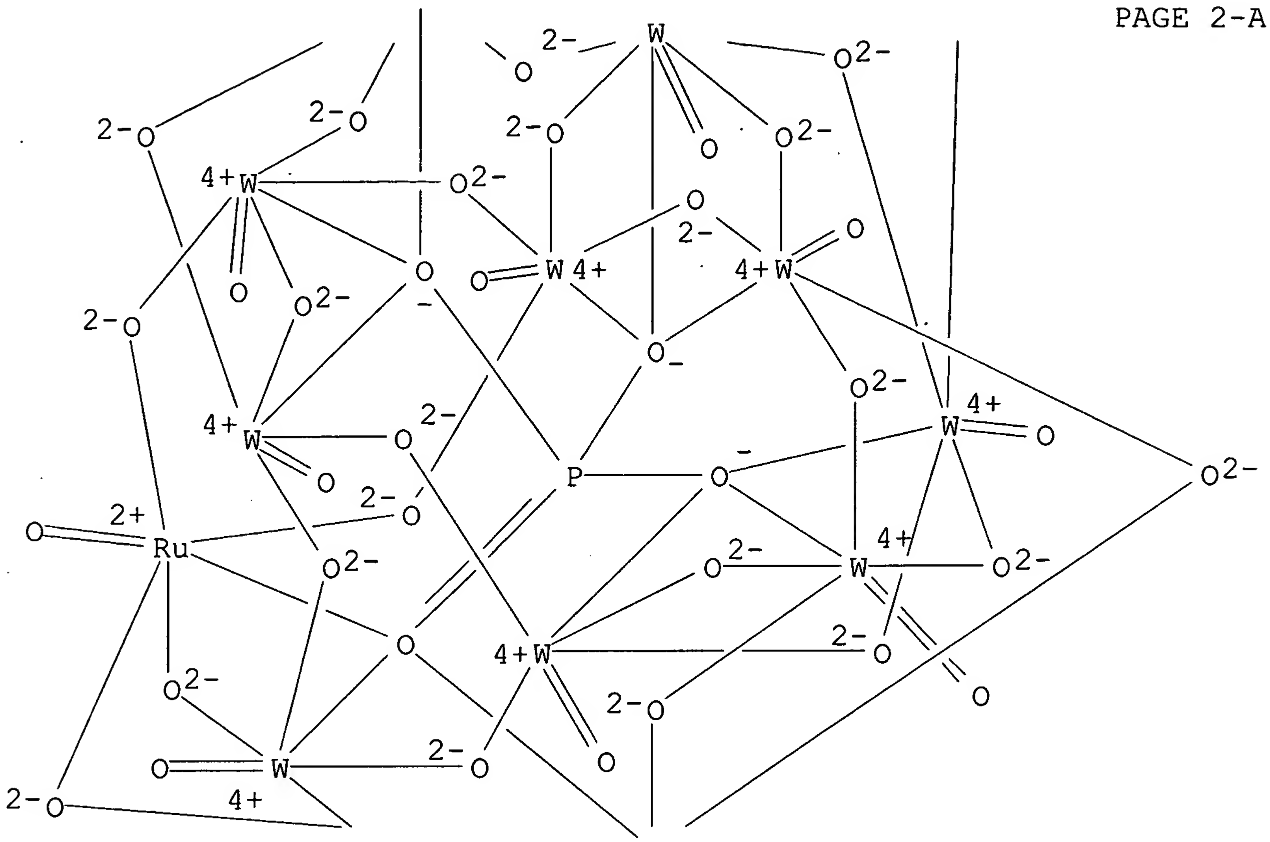


RN 139657-75-3 HCA

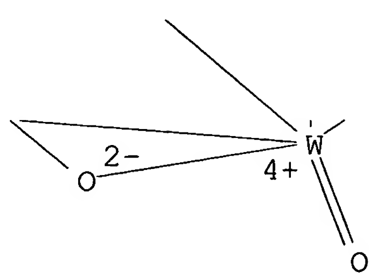
CN Tungstate(5-), tetracosa-μ-oxoundecaoxo(oxoruthenate)[μ12-[phosphato(3-)-O:O:O:O':O':O':O'':O'':O'':O''':O''':O''']]undeca- (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



PAGE 3-A



CC 72-2 (Electrochemistry)
IT 139657-65-1 **139657-74-2** **139657-75-3**
(electrochem. and catalytic properties of)

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L24            1 S BOUWAN ?/AU
L25            1 S L23 AND L24

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L26            1 S 17035-62-0

     FILE 'HCA' ENTERED AT 11:40:58 ON 17 OCT 2006
                 E PHOSPHATES, USES/CV
L27         4420 S E3
                 E PLATINUM-GROUP METALS/CV
L28         7971 S E3
                 E TRANSITION METALS, USES/CV
L29         4729 S E3
L30          160 S HYDROUS?(2A)(ORTHOPHOSPHATE# OR PHOSPHATE#)
L31            3 S L30 AND (L16 OR L17 OR L18)
L32            4 S L30 AND (52 OR 72)/SX,SC
L33            3 S L27 AND L28 AND L29
L34            1 S L33 AND (L16 OR L17 OR L18)
L35            1 S L33 AND (52 OR 72)/SX,SC
                 E PHOSPHATES/CV
L36        51243 S E3
L37       193547 S TRANSITION?(2A)METAL####
L38            5 S L36 AND L28 AND L37
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L42         1455 S (PT OR PD OR RU OR IR OR OS OR RE)/ELS AND 1/ELC.SUB
L43         6856 S L41 NOT L42

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L45      2018242 S L43
L46       601200 S PHOSPHATE# OR ORTHOPHOSPHATE#
L47         1987 S L44 AND L45 AND L46
L48           47 S L47 AND L16
L49           28 S L47 AND L17
L50           99 S L47 AND L18
L51              QUE CAT# OR CATALY?
L52           31 S L48 AND L51
L53            3 S L49 AND L51
L54           21 S L50 AND L51
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L55                 1 S E3
                      E HYDROGEN/CN
L56                 1 S E3

     FILE 'HCA' ENTERED AT 13:12:51 ON 17 OCT 2006
L57            391134 S L55
L58            317246 S L56
L59                11 S (L52 OR L53 OR L54) AND L57
L60                14 S (L52 OR L53 OR L54) AND L58
L61                 6 S L59 AND L60
L62                 6 S (L48 OR L49 OR L50) AND L57 AND L58
L63             36796 S (REDUC? OR REDN#)(2A)(L55 OR OXYGEN# OR O2 OR O)
L64             32867 S (OXIDA? OR OXIDI? OR OXIDN#)(2A)(L56 OR HYDROGEN# OR H2
L65                 5 S (L48 OR L49 OR L50) AND L63
L66                 3 S (L48 OR L49 OR L50) AND L64
L67                18 S L31 OR L32 OR L34 OR L35 OR L39 OR L40 OR L53 OR L61 OR
L68                18 S L67 NOT L19
L69                15 S L52 AND L54
L70                10 S L69 NOT (L19 OR L68)
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L68 ANSWER 1 OF 18 HCA COPYRIGHT 2006 ACS on STN

145:252378 Oxidation resistant electrode for **fuel cell**
. Mance, Andrew M.; Cai, Mei; Carriquiry, Cecilia; Ruthkosky, Martin S. (USA). U.S. Pat. Appl. Publ. US 2006188775 A1 20060824, 11pp. (English). CODEN: USXXCO. APPLICATION: US 2006-354213 20060214. PRIORITY: US 2005-654307P 20050218.

AB An **oxygen reducing** electrode for a **fuel cell** comprises carbon particles as support for catalyst particles. The carbon particles are coated with smaller particles of a metal oxide and/or metal **phosphate** (for example, TiO_2 particles) to impede destructive oxidn. (corrosion) of the carbon particles while permitting suitable elec. cond. between the carbon particles. The catalyst is carried on the smaller particle-coated carbon particles. Titanium dioxide particles can be dispersed on carbon particles suspended in a liq. medium by ultrasonic decompn. of a suitable titanium precursor compd.

IT **7440-06-4**, Platinum, uses
(oxidn. resistant electrode for **fuel cell**)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-32-6D**, Titanium, alkoxide
(oxidn. resistant electrode for **fuel cell**)
RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IT **7440-03-1**, Niobium, uses
(titania doped with; oxidn. resistant electrode for **fuel cell**)
RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

INCL 429044000; 429030000; 502101000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **fuel cell** oxidn resistant electrode
IT Catalysts
(electrocatalysts; oxidn. resistant electrode for **fuel cell**)
IT **Phosphates**, uses
(metal; oxidn. resistant electrode for **fuel cell**)
IT Coating materials
Fuel cell cathodes
Fuel cell electrodes
Fuel cells
(oxidn. resistant electrode for **fuel cell**)
IT Oxides (inorganic), uses
(oxidn. resistant electrode for **fuel cell**)
IT **7440-06-4**, Platinum, uses
(oxidn. resistant electrode for **fuel cell**)
IT 1317-70-0P, Anatase
(oxidn. resistant electrode for **fuel cell**)
IT 1312-43-2, Indium oxide 1313-99-1, Nickel oxide, uses 1314-23-4, Zirconium oxide, uses 1314-35-8, Tungsten oxide, uses 1317-80-2, Rutile 1332-29-2, Tin oxide 1332-37-2, Iron oxide, uses 1344-70-3, Copper oxide 7440-44-0, Carbon, uses 11098-99-0, Molybdenum oxide 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11118-57-3, Chromium oxide 13463-67-7, Titania, uses
(oxidn. resistant electrode for **fuel cell**)

IT **7440-32-6D**, Titanium, alkoxide **7440-32-6D**,
Titanium, halide 7782-44-7, Oxygen, processes
(oxidn. resistant electrode for **fuel cell**)
IT 603-34-9, Triphenylamine **7440-03-1**, Niobium, uses
(titania doped with; oxidn. resistant electrode for **fuel cell**)

L68 ANSWER 2 OF 18 HCA COPYRIGHT 2006 ACS on STN
145:62296 Methods for conditioning of hydroponic solutions and for supply of micronutrients. Matsumoto, Yukihide (Japan). Jpn. Kokai Tokkyo Koho JP 2006158384 A2 20060622, 18 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2005-235117 20050815.
AB The methods involve electrolysis in an electrolysis app. contg. ≥1 pair of insol. electrodes and ≥1 kind of sol. electrode contg. metals or alloys that become micronutrients in the hydroponic solns., by using the hydroponic solns. as electrolyte solns. for conditioning of the hydroponic solns. and for supply of micronutrients by corrosion and dissoln. of the sol. electrode. Electrolysis was conducted in app. contg. a hydroponic soln. for tomato by using an insol. Pt-plated Ti electrode, an insol. Ru-contg. mixed oxide-coated Ti expanded metal electrode, and a sol. metallic Zn electrode. The hydroponic soln. was kept at pH 5.5-6.5 and Zn concn. 0.47-0.66 ppm.
IT **7440-32-6**, Titanium, biological studies
((in)sol. electrode, micronutrient; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)
RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IT **1333-74-0**, Hydrogen, biological studies **7782-44-7**,
Oxygen, biological studies
(hydroponic soln. contg.; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7439-88-5**, Iridium, biological studies **7440-03-1**, Niobium, biological studies **7440-05-3**, Palladium, biological studies **7440-06-4**, Platinum, biological studies **7440-18-8**, Ruthenium, biological studies **7440-25-7**, Tantalum, biological studies **7440-67-7**, Zirconium, biological studies
(insol. electrode; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

RN 7439-88-5 HCA
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-25-7 HCA
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-67-7 HCA
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IT **7439-89-6**, Iron, biological studies **7439-96-5**, Manganese, biological studies **7439-98-7**, Molybdenum, biological studies **7440-02-0**, Nickel, biological studies **7440-50-8**, Copper, biological studies **7440-66-6**, Zinc, biological studies
(sol. electrode, micronutrient; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)
RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7439-98-7 HCA
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-66-6 HCA
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

CC 19-7 (Fertilizers, Soils, and Plant Nutrition)
Section cross-reference(s): 72

IT **Catalysts**
(electrocatalysts; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT Chelates
Nitrates, biological studies
Phosphates, biological studies
Sulfates, biological studies
(hydroponic soln. contg.; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT Oxides (inorganic), biological studies
(insol. electrode **catalyst** component; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT Anodes
Cathodes
Corrosion
Dissolution
Electrolysis
Electrolytic cells
Hydroponics
Sterilization and Disinfection
(methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT **7440-32-6**, Titanium, biological studies
((in)sol. electrode, micronutrient; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT 11113-84-1, Ruthenium oxide 107284-01-5, Iridium tantalum oxide
(electrode **catalyst**; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT **1333-74-0**, Hydrogen, biological studies 7440-09-7, Potassium, biological studies 7440-23-5, Sodium, biological studies 7704-34-9, Sulfur, biological studies 7727-37-9, Nitrogen, biological studies **7782-44-7**, Oxygen, biological studies 7782-91-4, Molybdic acid 16887-00-6, Chloride, biological studies

(hydroponic soln. contg.; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT **7439-88-5**, Iridium, biological studies **7440-03-1**, Niobium, biological studies **7440-05-3**, Palladium, biological studies **7440-06-4**, Platinum, biological studies **7440-18-8**, Ruthenium, biological studies **7440-25-7**, Tantalum, biological studies 7440-31-5, Tin, biological studies 7440-36-0, Antimony, biological studies **7440-67-7**, Zirconium, biological studies
(insol. electrode; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

IT 7429-90-5, Aluminum, biological studies **7439-89-6**, Iron, biological studies 7439-95-4, Magnesium, biological studies **7439-96-5**, Manganese, biological studies **7439-98-7**, Molybdenum, biological studies **7440-02-0**, Nickel, biological studies 7440-21-3, Silicon, biological studies 7440-42-8, Boron, biological studies 7440-44-0, Carbon, biological studies **7440-50-8**, Copper, biological studies **7440-66-6**, Zinc, biological studies 7440-70-2, Calcium, biological studies 7723-14-0, Phosphorus, biological studies
(sol. electrode, micronutrient; methods for conditioning of hydroponic solns. and for supply of micronutrients by electrolysis using insol. electrodes and sol. metal or alloy electrode)

L68 ANSWER 3 OF 18 HCA COPYRIGHT 2006 ACS on STN
144:220952 **Oxygen** electro-**reduction** catalysts for self-assembly on supports. Dougan, Jennifer; Panton, Raquel; Cheng, Qiling; Gervasio, Don F. (Center for Applied NanoBioScience, Arizona State Univ., Tempe, AZ, 85287-4004, USA). Proceedings of SPIE-The International Society for Optical Engineering, 5592(Nanofabrication: Technologies, Devices, and Applications), 220-240 (English) 2005. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB A new strategy for making low cost, catalytic electrodes is being developed for **fuel-cells** and **electrochem**. sensors. The strategy is to synthesize a macrocyclic catalyst derivatized with a functional group (like **phosphate** or carboxylate), which has affinity for a metal-oxide/metal surface. The purpose of the functional group is to anchor the modified catalyst to the metal surface, thereby promoting the formation of a self-assembled monolayer (SAM) of catalyst on a metal support. Syntheses are given for new ferrocene compds. and metalloporphyrins with anchor groups. The ferrocenes, which are relatively easy to synthesize, were made to learn how to form a stable SAM on a metal-oxide/metal surface. The metalloporphyrins were made for

catalyzing **oxygen** electro-**redn**. with no Pt.
Strategies for attaining an ideal catalytic electrode are discussed.

IT **7440-06-4**, Platinum, uses
(cyclic voltammetry of nickel and platinum in aq. acetonitrile contg. ferrocene)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-02-0**, Nickel, uses
(cyclic voltammetry of nickel electrode with self-assembled ferrocenehexylphosphonate in aq. acetonitrile)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

CC 72-2 (Electrochemistry)
Section cross-reference(s): 28, 29, 52, 78, 79

IT **Fuel cell** electrodes
(macrocycle derivatized with functional groups self-assembled on supports)

IT **Reduction**, electrochemical
(of **oxygen** on macrocycle derivatized with functional groups self-assembled on supports)

IT **7440-06-4**, Platinum, uses
(cyclic voltammetry of nickel and platinum in aq. acetonitrile contg. ferrocene)

IT **7440-02-0**, Nickel, uses
(cyclic voltammetry of nickel electrode with self-assembled ferrocenehexylphosphonate in aq. acetonitrile)

L68 ANSWER 4 OF 18 HCA COPYRIGHT 2006 ACS on STN

142:449363 Immobilized enzymes in biocathodes. Minteer, Shelley D.; Topcagic, Sabina; Treu, Becky (St. Louis University, USA). U.S. Pat. Appl. Publ. US 2005095466 A1 20050505, 38 pp. (English). CODEN: USXXCO. APPLICATION: US 2004-931147 20040831. PRIORITY: US 2003-517626P 20031105.

AB Disclosed is an improved biofuel cell having a cathode comprising a dual function membrane, which contains an oxygen oxidoreductase enzyme immobilized within a buffered compartment of the membrane and an electron transport mediator which transfers electrons from an electron-conducting electrode to the redox reaction **catalyzed** by the oxygen oxidoreductase enzyme. The improved biofuel cell also has an anode that contains an oxidoreductase

enzyme that uses an org. fuel, such as alc., as a substrate. An elec. current can flow between the anode and the cathode.

IT **1333-74-0**, Hydrogen, uses
(fuel; immobilized enzymes in biocathodes)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

IT **7439-89-6**, Iron, uses **7440-02-0**, Nickel, uses **7440-04-2**, Osmium, uses **7440-15-5**, Rhenium, uses **7440-16-6**, Rhodium, uses **7440-18-8**, Ruthenium, uses **7440-48-4D**, Cobalt, complex
(immobilized enzymes in biocathodes)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-04-2 HCA
CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

RN 7440-15-5 HCA
CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

IT **7782-44-7**, Oxygen, processes
(immobilized enzymes in biocathodes)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H01M004-86
ICS H01M008-00
INCL 429012000; 429013000; 429042000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 7
ST **fuel cell** immobilized enzyme biocathode
IT **Fuel cells**
(biochem. **fuel cells**; immobilized enzymes in biocathodes)
IT **Catalysts**
(electrocatalysts; immobilized enzymes in biocathodes)
IT Electric conductors
Fuel cell cathodes
(immobilized enzymes in biocathodes)
IT **Fuel cells**
(polymer **electrolyte**, membrane; immobilized enzymes in biocathodes)
IT 50-00-0, Formaldehyde, uses 50-28-2, Estradiol, uses 50-99-7, D-Glucose, uses 53-57-6, NADPH 56-73-5, Glucose-6-**phosphate** 56-81-5, Glycerol, uses 57-60-3, PYruvate, uses 58-22-0, Testosterone 58-68-4, Nadh 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 71-47-6, Formate, uses 71-50-1, Acetate, uses 72-89-9, Acetyl co-A 75-07-0, Acetaldehyde, uses 78-83-1, Isobutanol, uses 79-33-4, uses 85-61-0, Coenzyme A, uses 87-78-5, Mannitol 96-41-3, Cyclopentanol 104-54-1, Cinnamyl alcohol 107-18-6, Allyl alcohol, uses 113-21-3, Lactate, uses 116-31-4, Retinal 123-72-8, Butanal 126-44-3, Citrate, uses 149-61-1, Malate 320-77-4 383-86-8, Glycerate 458-35-5, Coniferyl alcohol 608-59-3, Gluconate 820-11-1 921-60-8, L-Glucose **1333-74-0**, Hydrogen, uses 1643-19-2, Tetrabutylammonium

bromide 2002-48-4, Glucuronate 3615-39-2, Sorbose 7664-41-7, Ammonia, uses 10326-41-7, uses 26264-14-2, Propanediol 26566-61-0, Galactose 29354-98-1, Hexadecanol 30237-26-4, Fructose 31103-86-3, Mannose 35296-72-1, Butanol 62309-51-7, Propanol 157663-13-3, L-Gluconic acid
(fuel; immobilized enzymes in biocathodes)

IT **7439-89-6**, Iron, uses **7440-02-0**, Nickel, uses **7440-04-2**, Osmium, uses **7440-15-5**, Rhenium, uses **7440-16-6**, Rhodium, uses **7440-18-8**, Ruthenium, uses **7440-48-4D**, Cobalt, complex
(immobilized enzymes in biocathodes)

IT **7782-44-7**, Oxygen, processes
(immobilized enzymes in biocathodes)

L68 ANSWER 5 OF 18 HCA COPYRIGHT 2006 ACS on STN

142:376427 Electro-catalysis of the Cu/carbon cathode for the **reduction** of **O2** during **fuel-cell** reactions. Nabae, Yuta; Yamanaka, Ichiro; Otsuka, Kiyoshi (Department of Applied Chemistry, Graduate School of Science and Engineering, Tokyo Institute of Technology, Meguro-ku, Tokyo, 152-8552, Japan). Applied Catalysis, A: General, 280(2), 149-155 (English) 2005. CODEN: ACAGE4. ISSN: 0926-860X. Publisher: Elsevier B.V..

AB To develop a new cathode without using Pt for a H2/O2 polymer-**electrolyte**-membrane-**fuel-cell**, the authors studied the possibility of using a Cu/carbon cathode for the **redn.** of **O2**. The plan for development of the Cu/carbon cathode is: (i) formation of redox functional groups on carbon to promote electron-transfer reaction, (ii) deposition of phosphorus groups on carbon to promote proton diffusion and (iii) loading Cu on the modified carbon support. The electro-catalytic activity of the Cu/carbon cathode was not so excellent as that of the Pt/carbon cathode, but it was fairly good at lower P(O2). To clarify the Cu function for the acceleration of the **O2** **redn.**, the authors characterized the Cu/carbon electro-catalyst with XRD, SEM and CV measurements. When the oxidn. state of Cu was 2+ at higher cell voltages, the **redn.** of **O2** was accelerated. However, when metallic Cu was formed at lower cell voltages, the enhancing effect of Cu disappeared. The CV data strongly suggested that Cu2+ species functioned as an adsorption site of O2, not as a redox mediator. From the exptl. results, a suitable model of the **redn.** mechanism of **O2** over the Cu/carbon cathode was proposed.

IT **7440-06-4**, Platinum, uses
(electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel-cell** reactions)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7439-89-6**, Iron, uses **7439-91-0**, Lanthanum, uses **7439-96-5**, Manganese, uses **7440-02-0D**, Nickel, compds. **7440-47-3**, Chromium, uses **7440-48-4**, Cobalt, uses
(metal modifiers to catalyst; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel -cell** reactions)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-91-0 HCA
CN Lanthanum (8CI, 9CI) (CA INDEX NAME)

La

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-47-3 HCA
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

IT **7440-50-8**, Copper, uses

(modifier on carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel** **-cell** reactions)

RN 7440-50-8 HCA

CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

IT **7440-50-8D**, Copper, compds.
(on modified carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel** **-cell** reactions)

RN 7440-50-8 HCA

CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72, 76

ST electro catalysis copper carbon support cathode redn **fuel** **cell**; **oxygen** electrochem **redn** catalyst **phosphate** copper transition metal modified

IT **Fuel cell** cathodes
Membrane electrodes
(electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel-cell** reactions)

IT Fluoropolymers, uses
(electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel-cell** reactions)

IT Reduction catalysts
(electrochem.; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel-cell** reactions)

IT Polyoxyalkylenes, uses
(fluorine- and sulfo-contg., ionomers; electro-catalysis of Cu/carbon cathode for **redn.** of **O** during **fuel-cell** reactions)

IT Transition metal compounds
(metal modifiers to catalyst; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel** **-cell** reactions)

IT Electric current-potential relationship
(of assembled **fuel cells**; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel-cell** reactions)

IT Oxidation

(of carbon with nitric acid, phosphoric acid, and **phosphate**; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT Cyclic voltammetry
(of electrocatalyst electrodes; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel -cell** reactions)

IT Adsorption
(of oxygen; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT **Fuel cells**
(polymer **electrolyte**; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel -cell** reactions)

IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-contg., ionomers; electro-catalysis of Cu/carbon cathode for **redn**. of **O** during **fuel-cell** reactions)

IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-contg.; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT Carbon black, uses
(support; electro-catalysis of Cu/carbon cathode for **redn** . of **O2** during **fuel-cell** reactions)

IT Carbon fibers, uses
(vapor grown; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT 7440-44-0, Activated carbon, uses
(activated; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT **7440-06-4**, Platinum, uses 9002-84-0, F 104
(electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT 66796-30-3, Nafion 117
(electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT 7664-38-2, Phosphoric acid, uses 7697-37-2, Nitric acid, uses 7722-76-1, Ammonium dihydrogen **phosphate**
(electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-cell** reactions)

IT 7722-84-1, Hydrogen peroxide, formation (nonpreparative)
(initial reaction product; electro-catalysis of Cu/carbon cathode for **redn**. of **O2** during **fuel-**

cell reactions)

IT **7439-89-6**, Iron, uses **7439-91-0**, Lanthanum, uses **7439-96-5**, Manganese, uses **7440-02-0D**, Nickel, compds. 7440-45-1, Cerium, uses **7440-47-3**, Chromium, uses **7440-48-4**, Cobalt, uses
(metal modifiers to catalyst; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel -cell** reactions)

IT **7440-50-8**, Copper, uses
(modifier on carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel -cell** reactions)

IT 14265-44-2, **Phosphate**, uses
(modifier on carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel -cell** reactions)

IT **7440-50-8D**, Copper, compds.
(on modified carbon support; electro-catalysis of Cu/carbon cathode for **redn.** of **O2** during **fuel -cell** reactions)

L68 ANSWER 6 OF 18 HCA COPYRIGHT 2006 ACS on STN

142:358039 **Hydrous phosphate** catalysts with low platinum for **fuel cells.** Swider-Lyons, Karen; Bouwan, Peter J. (USA). U.S. Pat. Appl. Publ. US 2005069753 A1 20050331, 13 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-672270 20030926.

AB A device is provided having a cathode capable of catalytically **reducing oxygen**, an anode capable of catalytically **oxidizing hydrogen**, and an electrolyte in contact with both the anode and cathode. The cathode and/or anode contain **transition-metal phosphates** with the formula M1-M2PxOy·zH2O, where M1 is a platinum group metal and M2 is a **transition metal.**

IT **7439-89-6**, Iron, uses **7439-98-7**, Molybdenum, uses **7440-03-1**, Niobium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-25-7**, Tantalum, uses **7440-32-6**, Titanium, uses **7440-33-7** , Tungsten, uses **7440-47-3**, Chromium, uses **7440-48-4**, Cobalt, uses **7440-62-2**, Vanadium, uses **7440-66-6**, Zinc, uses **7440-67-7**, Zirconium, uses
(**hydrous phosphate** catalysts with low platinum for **fuel cells**)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-98-7 HCA
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-25-7 HCA
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-47-3 HCA
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-62-2 HCA
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

RN 7440-66-6 HCA
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

RN 7440-67-7 HCA
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IC ICM H01M004-90
ICS H01M008-10; H01M004-96
INCL 429040000; 429044000; 429030000; 429033000
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 67
ST **fuel cell hydrous phosphate**
catalyst low platinum
IT Platinum-group metal compounds
(alloys; **hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT Catalysts
(electrocatalysts; **hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT **Phosphates, uses**
Platinum-group metals
Transition metals, uses
(**hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT Sulfonic acids, uses
(perfluorosulfonic acid polymers; **hydrous phosphate** catalysts with low platinum for **fuel cells**)

IT **Transition metal** alloys
(platinum-group metal alloys; **hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT **Fuel cells**
(proton exchange membrane; **hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT Fluoropolymers, uses
(sulfo-contg., perfluoro; **hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT Carbon black, uses
(support; **hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT 7440-44-0, Carbon, uses
(Vulcan; **hydrous phosphate** catalysts with low platinum for **fuel cells**)
IT **7439-89-6**, Iron, uses **7439-98-7**, Molybdenum, uses **7440-03-1**, Niobium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-25-7**, Tantalum, uses 7440-31-5, Tin, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses 7440-36-0, Antimony, uses **7440-47-3**, Chromium, uses **7440-48-4**, Cobalt, uses **7440-62-2**, Vanadium, uses **7440-66-6**, Zinc, uses **7440-67-7**, Zirconium, uses 10045-86-0, Iron **phosphate** 17035-62-0
(**hydrous phosphate** catalysts with low platinum for **fuel cells**)

L68 ANSWER 7 OF 18 HCA COPYRIGHT 2006 ACS on STN
142:199613 Polymer compositions for composites with high dielectric constant and low dielectric loss tangent, their cured products, and their curable films. Satsu, Yuichi; Amaha, Satoru; Takahashi, Akio; Watabe, Noriyuki; Unno, Seido; Fujieda, Tadashi; Akaboshi, Haruo; Nagai, Akira (Hitachi Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2005041966 A2 20050217, 26 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2003-202162 20030728.
AB The compns. for **capacitor** formation in multilayer circuit boards comprise crosslinkers having wt.-av. mol. wt. ≤1000 and groups of (CH2:CC6R1mH4-m)nR (R = hydrocarbon residue; R1 = H, Me, Et; m = 1-4; n ≥ 2), polymers having wt.-av. mol. wt. ≥5000, and dispersed metal powder-based inorg. fillers having each component av. size ≤5 μm and have dielec. const. ≥15 and dielec. loss tangent ≤0.05 at frequency region 100 MHz to 80 GHz. The cured products are obtained by curing the compns. and have dielec. loss tangent after curing ≤0.05. The films contain the above crosslinkers, film-formable polymers, and the above fillers and satisfy the same dielec. const. and the dielec. loss tangent as the compns. Thus, a varnish contg. Zeonex 480 (cyclic polyolefin), 1,2-bis(vinylphenyl)ethane, a

catalyst, and toluene was kneaded with **phosphated** and surface-treated Fe powder to give a mixt., which was dried and hot-pressed to give a composite showing dielec. const. (1-40 GHz) 90-70, dielec. loss tangent (1-40 GHz) 0.05-0.03, and vol.-intrinsic resistivity 5 + 1013 Ω-cm.

IT **7440-43-9**, Cadmium, uses
(powd. composite with $BaTiO_3$, metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7440-43-9 HCA

CN Cadmium (8CI, 9CI) (CA INDEX NAME)

Cd

IT **7439-96-5**, Manganese, uses **7440-66-6**, Zinc, uses
(powd., metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7439-96-5 HCA

CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-66-6 HCA

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **7440-47-3**, Chromium, uses
(powd., metal power coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IT **7439-89-6**, Iron, uses
(powd., powd. composite with Al_2O_3, metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

IT **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses **7440-22-4**, Silver, uses **7440-25-7**, Tantalum, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses **7440-50-8**, Copper, uses **7440-67-7**, Zirconium, uses
(powd.; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

RN 7439-98-7 HCA
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-25-7 HCA
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-67-7 HCA
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IC ICM C08F291-00
ICS C08J005-18; C08K003-00; C08K005-01; C08L101-00; H01B003-00; H01B003-44; H01L023-14
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76
ST polyolefin vinylphenylethane crosslinker **phosphated** iron powder composite; dielec const loss tangent polymer inorg powder composite; styrene crosslinker polymer metal powder dispersion film
IT **Phosphates**, uses
(metal power surface insulated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)
IT **7440-43-9**, Cadmium, uses
(powd. composite with $BaTiO_3$, metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)
IT **7439-96-5**, Manganese, uses **7440-66-6**, Zinc, uses
(powd., metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)
IT **7440-47-3**, Chromium, uses
(powd., metal power coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with

high dielec. const. and low dielec. loss tangent)

IT **7439-89-6**, Iron, uses
(powd., powd. composite with Al2O3, metal powder coated with; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-06-4**, Platinum, uses 7440-21-3, Silicon, uses **7440-22-4**, Silver, uses **7440-25-7**, Tantalum, uses 7440-31-5, Tin, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses 7440-36-0, Antimony, uses **7440-50-8**, Copper, uses **7440-67-7**, Zirconium, uses
(powd.; polymer compns. contg. crosslinkers and metal-based inorg. powder for composites with high dielec. const. and low dielec. loss tangent)

L68 ANSWER 8 OF 18 HCA

142:121992 Platinum-Iron Phosphate Electrocatalysts for Oxygen Reduction in PEMFCs. Bouwman, Peter J.; Dmowski, Wojtek; Stanley, Jason; Cotten, Gregory B.; Swider-Lyons, Karen E. (Surface Chemistry Branch, Naval Research Laboratory, Washington, DC, 20375, USA). Journal of the Electrochemical Society, 151(12), A1989-A1998 (English) 2004. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB Proton exchange membrane **fuel cells** (PEMFCs) depend on Pt at the cathode to catalyze the O redn. reaction (ORR) and maintain high performance. This report shows that the electrocatalytic activity of Pt is enhanced when it is dispersed in a matrix of **hydrous** Fe **phosphate** (FePO). The Pt-FePO has 2 nm micropores with Pt dispersed as ions in Pt2+ and Pt4+ oxidn. states. Increased ORR performance is demonstrated for the Pt-FePO+Vulcan carbon (VC) materials compared to a std. 20% Pt-VC catalyst on rotating disk electrodes with Pt-loadings of 0.1 mg(Pt) cm-2. The improvement in the ORR is attributed to the adsorption/storage of oxygen on the FePO, presumably as Fe-hydroperoxides. The ORR activity of the Pt-FePO in air is close to that in oxygen at low c.d., and therefore this catalyst has a distinctly unique behavior from Pt-VC. Contrary to Pt-VC, the Pt-FePO catalyst shows activity towards hydrogen and CO oxidn., but does not exhibit their characteristic adsorption peaks, suggesting that Pt ions in the Fe phosphate structure are less sensitive to poisoning than metallic Pt. The results present opportunities for new low-Pt catalysts that extend beyond the current capabilities of Pt-VC.

CC **72-2** (Electrochemistry)
Section cross-reference(s): **52**, 67

ST platinum iron phosphate electrocatalyst oxygen redn; carbon black platinum iron phosphate electrocatalyst oxygen redn; proton exchange membrane **fuel cell** electrocatalyst oxygen redn;
PEMFC platinum iron phosphate carbon black electrocatalyst oxygen redn

IT Carbon black, uses
(Vulcan; electrocatalyst from platinum-iron phosphate with and without Vulcan carbon for electrocatalysts for oxygen redn. in proton exchange membrane **fuel cells**)

IT **Fuel cell** cathodes
(platinum-iron phosphate with and without Vulcan carbon for electrocatalysts for oxygen redn.)

IT 7440-06-4, Platinum, uses 10045-86-0, Iron phosphate fepo4
(electrocatalyst from platinum-iron phosphate with and without Vulcan carbon for electrocatalysts for oxygen redn. in proton exchange membrane **fuel cells**)

IT 7782-44-7, Oxygen, properties
(electrocatalyst from platinum-iron phosphate with and without Vulcan carbon for electrocatalysts for oxygen redn. in proton exchange membrane **fuel cells**)

L68 ANSWER 9 OF 18 HCA COPYRIGHT 2006 ACS on STN

142:117649 Biofuel cell. Karamanev, Dimitre (The University of Western Ontario, Can.). PCT Int. Appl. WO 2005001981 A2 20050106, 43 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2004-CA943 20040625. PRIORITY: US 2003-482765P 20030627.

AB The present invention discloses a new type of biofuel cell, based on the microbial regeneration of the oxidant, ferric ions. The bio-**fuel cell** is based on the cathodic redn. of ferric to ferrous ions, coupled with the microbial regeneration of ferric ions by the oxidn. of ferrous ions, with fuel (such as **hydrogen**) **oxidn**. on the anode. The microbial regeneration of ferric ions is achieved by chemolithotrophic microorganisms such as Acidithiobacillus ferrooxidans. Elec. generation is coupled with the consumption of carbon dioxide from atm. and its transformation into microbial cells, which can be used as a single-cell protein.

IT **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-57-5**, Gold, uses
(biofuel cell)

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **7782-44-7**, Oxygen, processes **15438-31-0**, Iron(2+), processes **20074-52-6**, Iron(3+), processes
(biofuel cell)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

RN 15438-31-0 HCA
CN Iron, ion (Fe2+) (8CI, 9CI) (CA INDEX NAME)

Fe^{2+}

RN 20074-52-6 HCA
CN Iron, ion (Fe3+) (8CI, 9CI) (CA INDEX NAME)

Fe^{3+}

IT **7440-02-0**, Nickel, uses
(biofuel cell)
RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT **1333-74-0**, **Hydrogen**, uses

(biofuel **cell**)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IC ICM H01M008-18
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 9
ST **fuel cell** biochem; single cell protein synthesis
IT **Fuel cells**
(biochem. **fuel cells**; biofuel **cell**)
IT **Catalysts**
(electrocatalysts; biofuel cell)
IT **Fuel cells**
(proton exchange membrane; biofuel cell)
IT 7439-92-1, Lead, uses **7440-05-3**, Palladium, uses
7440-06-4, Platinum, uses **7440-57-5**, Gold, uses
(biofuel cell)
IT **7782-44-7**, Oxygen, processes **15438-31-0**, Iron(2+),
processes **20074-52-6**, Iron(3+), processes
(biofuel cell)
IT **7440-02-0**, Nickel, uses 7440-44-0, Carbon, uses
12597-68-1, Stainless steel, uses
(biofuel cell)
IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 74-82-8, Methane,
uses **1333-74-0**, **Hydrogen**, uses 1344-28-1,
Alumina, uses 7631-86-9, Silica, uses 7778-18-9, Calcium sulfate
(biofuel **cell**)
IT 7447-40-7, Potassium chloride, uses 7487-88-9, Magnesium sulfate,
uses 7664-93-9, Sulfuric acid, uses 7778-53-2, Potassium
phosphate 7783-20-2, Ammonium sulfate, uses 10043-52-4,
Calcium chloride, uses 10124-37-5, Calcium nitrate
(nutrient; biofuel cell)

L68 ANSWER 10 OF 18 HCA COPYRIGHT 2006 ACS on STN
140:273630 Electrochemical generation, storage and reaction of hydrogen
and oxygen. Sanders, Nicholas (Diffusion Science, Inc., USA). PCT
Int. Appl. WO 2004027901 A2 20040401, 92 pp. DESIGNATED STATES: W:
AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO,
CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL,
PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI,
CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE,
NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2.

APPLICATION: WO 2003-US29802 20030917. PRIORITY: US 2002-411443P 20020917; US 2003-455215P 20030317.

AB The invention concerns an electrolytic app. for using **catalyst**-coated hollow microspheres to produce gases, store them, and to make them available for later use. The app. uses **catalyst**-coated hollow microspheres in reversible electrochem. processes and reactions, such as those used in conjunction with water dissocn., **fuel cells**, and rechargeable **batteries**. The app. can be used to manuf. and store hydrogen and or oxygen and to make them available for subsequent use as raw materials for use in electrochem. and chem. reactions or as a fuel and or oxidizer for a combustion engine. The app. can be used as a hydrogen-oxygen hermetically sealed secondary **battery**. The app. can be used as a hydrogen storage portion of certain types of secondary **batteries**. Hydrogen and oxygen can be stored within hollow microspheres at moderate temp. and pressure, eliminating the need for expensive storage and handling equipment, and increasing the mobility of hydrogen-powered vehicles. Storage of hydrogen and or oxygen within the microspheres significantly reduces flammability and explosion concerns and resolves many **fuel cell** scalability issues.

IT **7439-89-6**, Iron, uses **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-15-5**, Rhenium, uses **7440-16-6**, Rhodium, uses **7440-22-4**, Silver, uses **7440-25-7**, Tantalum, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses **7440-43-9**, Cadmium, uses **7440-47-3**, Chromium, uses **7440-48-4**, Cobalt, uses **7440-50-8**, Copper, uses **7440-57-5**, Gold, uses **7440-62-2**, Vanadium, uses **7440-67-7**, Zirconium, uses

(electrochem. generation, storage and reaction of hydrogen and oxygen)

RN 7439-89-6 HCA

CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-98-7 HCA

CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-15-5 HCA
CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-25-7 HCA
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-43-9 HCA
CN Cadmium (8CI, 9CI) (CA INDEX NAME)

Cd

RN 7440-47-3 HCA
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

RN 7440-62-2 HCA
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

RN 7440-67-7 HCA
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**,
Oxygen, preparation
(electrochem. generation, storage and reaction of hydrogen and
oxygen)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM H01M004-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57, 72
ST electrochem generation storage reaction hydrogen oxygen;
fuel cell electrochem generation
storage reaction hydrogen oxygen; **battery**
electrochem generation storage reaction hydrogen oxygen;
electrolyzer electrochem generation storage reaction hydrogen oxygen
IT **Catalysts**
Ceramics
Composites
Electrodeposition
Electrodes
Electrolytic cells
Fuel cells
Glass ceramics
Microspheres
Secondary **batteries**
Sintering
Sol-gel processing
Sputtering
Welding
(**electrochem.** generation, **storage** and
reaction of hydrogen and oxygen)
IT **Phosphate** glasses
(electrochem. generation, storage and reaction of hydrogen and
oxygen)
IT 7429-90-5, Aluminum, uses **7439-89-6**, Iron, uses

7439-98-7, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-15-5**, Rhenium, uses **7440-16-6**, Rhodium, uses 7440-17-7, Rubidium, uses 7440-21-3, Silicon, uses **7440-22-4**, Silver, uses **7440-25-7**, Tantalum, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses 7440-41-7, Beryllium, uses **7440-43-9**, Cadmium, uses 7440-44-0, Carbon, uses **7440-47-3**, Chromium, uses **7440-48-4**, Cobalt, uses **7440-50-8**, Copper, uses 7440-55-3, Gallium, uses **7440-57-5**, Gold, uses **7440-62-2**, Vanadium, uses **7440-67-7**, Zirconium, uses 7440-74-6, Indium, uses
(electrochem. generation, storage and reaction of hydrogen and oxygen)

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(electrochem. generation, storage and reaction of hydrogen and oxygen)

L68 ANSWER 11 OF 18 HCA COPYRIGHT 2006 ACS on STN

139:125929 Solid electrolytes of high ion conductivity and electrochemical systems therewith. Sawa, Haruo (Nippon Kodoshi Kogyo K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2003208814 A2 20030725, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-4151 20020111.

AB The electrolytes comprise composites of hydrous stannate compds. and poly(vinyl alc.) (PVA) and may contain silicates, borates, molybdates, tungstates, and/or phosphates. The composites may be submerged in acid solns. **Fuel cells**, steam pumps, dehumidifiers, **electrolytic cells**, electrochromic app., **batteries**, etc., including the electrolytes are also claimed.

IC ICM H01B001-06
ICS C08K003-24; C08L029-04; H01M006-22; H01M008-02; H01M010-30

CC 76-2 (Electric Phenomena)
Section cross-reference(s): 47, **52**

ST proton cond electrolyte stannate PVA composite; hydrous stannate polyvinyl alc composite electrolyte; **battery fuel cell electrolyte** proton conductor; electrochromic **electrolytic cell electrolyte** PVA stannate

IT **Battery** electrolytes
([hydrous stannate/PVA composites as solid electrolytes of high ion cond. for electrochem. systems)

IT Air conditioners
Electrochromic devices
Electrolytic cells

Fuel cell electrolytes
Optical switches
Sensors
(hydrous stannate/PVA composites as solid electrolytes of high ion cond. for electrochem. systems)

IT 1330-43-4, Sodium borate 1344-09-8, Sodium silicate 7601-54-9, Sodium **phosphate** 7631-95-0, Sodium molybdate 13472-45-2, Sodium tungstate
(**hydrous** stannate/PVA composites as solid electrolytes of high ion cond. for electrochem. systems)

L68 ANSWER 12 OF 18 HCA COPYRIGHT 2006 ACS on STN
136:39651 Fuel reforming apparatus. Haga, Fumihiro; Kaneko, Hiroaki (Nissan Motor Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001348203 A2 20011218, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-165093 20000601.

AB The title app. includes fuel reforming **catalysts** for generating H-rich reformed gas by reforming reaction of supplying fuel gas with steam and O, and the existing ratio of metal oxide material in the reforming **catalysts** at the introduction side of the fuel gas is larger than that at the discharge side of the reformed gas. The partial oxidn. reaction at the fuel gas introduction side is delayed, rapid temp. rise at that portion is suppressed, and CO concn. is decreased. The reforming **catalysts** are plural kinds of monolithic **catalysts** having different quantities of metal oxide material coated on **catalyst** supports, resp. The metal oxide material is an O-absorbing material, e.g., CeO2 or Ce-contg. composite oxide. The fuel gas can be hydrocarbon, MeOH, etc. The H-rich reformed gas can be used as fuel gas of **fuel cells**, e.g., solid polymer **electrolyte fuel cells**, **phosphate fuel cells**, etc.

IT **7440-05-3**, Palladium, uses **7440-66-6**, Zinc, uses
(**catalysts** contg.; fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-66-6 HCA
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **1333-74-0P**, Hydrogen, preparation
(fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-44-7**, Oxygen, reactions
(fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM C01B003-32
ICS B01J023-60; C01B003-40; H01M008-06; H01M008-10
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 51, 52, 67
ST reforming app **catalyst** oxide content; hydrogen rich reformed gas generation; ceria content reforming **catalyst**; **fuel cell hydrogen** rich reformed gas
IT Oxides (inorganic), uses
(**catalysts** contg.; fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)
IT **Fuel cells**
Reforming apparatus
Reforming **catalysts**
Steam reforming **catalysts**
(**fuel** reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)
IT Fuel gas manufacturing
(reforming; fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)
IT Fuel gas manufacturing
(steam reforming; fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)
IT 1306-38-3, Ceria, uses **7440-05-3**, Palladium, uses **7440-66-6**, Zinc, uses
(**catalysts** contg.; fuel reforming app. with metal oxide-contg. **catalysts** for generating hydrogen-rich reforming gas)
IT **1333-74-0P**, Hydrogen, preparation
(fuel reforming app. with metal oxide-contg. **catalysts**

for generating hydrogen-rich reforming gas)

IT 67-56-1, Methanol, reactions **7782-44-7**, Oxygen, reactions
(fuel reforming app. with metal oxide-contg. **catalysts**
for generating hydrogen-rich reforming gas)

L68 ANSWER 13 OF 18 HCA COPYRIGHT 2006 ACS on STN

114:194704 Charge transfer and recombination kinetics at photoelectrodes. A quantitative evaluation of impedance measurements. Schefold, J.; Kuehne, H. M. (Inst. Phys. Elektron., Univ. Stuttgart, Stuttgart, W-7000/80, Germany). Journal of Electroanalytical Chemistry and Interfacial Electrochemistry, 300(1-2), 211-33 (English) 1991. CODEN: JEIEBC. ISSN: 0022-0728.

AB Impedance measurements were performed with illuminated photoelectrodes (bare and Pt-coated p-InP) at frequencies between 0.1 Hz and 1 MHz. Two different five-element equiv. circuits are discussed, both resulting in a satisfying fit of the impedance data. Mott-Schottky data and the photocurrent-voltage behavior cannot be explained by a Maxwell-type circuit (involving surface states). A Voigt-type circuit, however, does describe adequately the recombination behavior of the photoelectrode, the electrochem. charge transfer reaction (hydrogen evolution), and anomalies in Mott-Schottky evaluations. From the recombination and charge transfer resistances, the Schottky diode ideality factor, the electrochem. exchange c.d., and the cathodic charge transfer coeff. are derived. Measured Helmholtz capacity values are at 3-30 μF/cm2 with bare p-InP during current flow. The results are in agreement with the model of a Schottky barrier (photovoltage build-up) with subsequent charge transfer across the metal (**catalyst**)/electrolyte interface.

IT **7440-66-6**, Zinc, properties
(elec. impedance of indium phosphide doped with, with or without platinum deposit)

RN 7440-66-6 HCA

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **7440-06-4**, Platinum, properties
(elec. impedance of indium phosphide with deposit of, in acidic soln.)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

CC 72-2 (Electrochemistry)

Section cross-reference(s): 67, 74, 76

IT Electric double layer
(**capacitance** of, for indium phosphide, in acidic solns.)

IT Interface
(indium **phosphate**-electrolyte, with platinum deposit, barrier for)

IT **7440-66-6**, Zinc, properties
(elec. impedance of indium phosphide doped with, with or without platinum deposit)

IT **7440-06-4**, Platinum, properties
(elec. impedance of indium phosphide with deposit of, in acidic soln.)

L68 ANSWER 14 OF 18 HCA COPYRIGHT 2006 ACS on STN

107:14520 Electrochemical and surface science investigations of platinum-chromium alloy electrodes. Paffett, M. T.; Daube, K. A.; Gottesfeld, S.; Campbell, C. T. (Chem. Electron. Div., Los Alamos Natl. Lab., Los Alamos, NM, 87545, USA). Journal of Electroanalytical Chemistry and Interfacial Electrochemistry, 220(2), 269-85 (English) 1987. CODEN: JEIEBC. ISSN: 0022-0728.

AB Electrodes of supported Pt, modified the Cr, showed an increase in electrochem. activity for **O redn.** in H3PO4 **fuel cells** compared with unmodified supported Pt only electrodes. To clarify the role of Cr and its chem. nature at the electrode surface, a series of PtxCr(1-x) bulk alloys (x = 0.9, 0.65, 0.5, 0.2) were characterized by electrochem. and ex-situ surface science methods. The surface characterization of native and post-electrochem. electrodes were studied by XPS, cyclic voltammetry in 0.05M H2SO4 and 85% H3PO4, and anal. of 0.05M H2SO4 electrolyte following electrochem. treatment. The surface Cr (1-2 nm) was oxidized to Cr2O3 for surfaces at open circuit and those exposed to potentials less than +1.3 V vs. DHE (dynamic H electrode) in 0.05M H2SO4 and less than +1.55 V vs. DHE in 85% H3PO4. In 0.05M H2SO4, the Cr component was electrooxidized to sol. Cr6+ species at potentials greater than +1.3 V with the extent of Cr dissoln. dependent upon the initial alloy stoichiometry. Alloys with Cr content ≥0.5 are capable of producing (dependent on time spent at potentials greater than +1.3 V in 0.05M H2SO4) very porous Pt-rich surfaces. Loss of Cr was also obsd. in 85% H3PO4 for the alloys with Cr content ≥0.5, although at the more pos. potential the limit was +1.55 V. For Pt0.2Cr0.8, treatments in 85% H3PO4 at +1.4 V and above led to the appearance of Pt4+ and Cr6+ species, apparently stabilized in a porous **phosphate** overlayer ≤5 nm thick (dependent on time spent at potentials above this limit). The enhancement reported for supported Pt + Cr O cathodes is discussed in the light of these results.

IT **7440-47-3**, Chromium, reactions

(cyclic voltammetry of, in acid solns., comparison with platinum-chromium alloys, XPS in relation to)

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IT **7440-06-4**, Platinum, reactions
(cyclic voltammetry of, in phosphoric acid and in sulfuric acid solns., comparison with platinum-chromium alloys, XPS in relation to)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

CC 72-2 (Electrochemistry)
Section cross-reference(s): 52, 67

IT Electrodes
(**fuel-cell**, platinum-chromium alloys)

IT **7440-47-3**, Chromium, reactions
(cyclic voltammetry of, in acid solns., comparison with platinum-chromium alloys, XPS in relation to)

IT **7440-06-4**, Platinum, reactions
(cyclic voltammetry of, in phosphoric acid and in sulfuric acid solns., comparison with platinum-chromium alloys, XPS in relation to)

L68 ANSWER 15 OF 18 HCA COPYRIGHT 2006 ACS on STN

106:159325 Automatic pH control in a process for removal of hydrogen sulfide from a gas. Chang, Dane; Bedell, Stephen A. (Dow Chemical Co., USA). U.S. US 4643886 A 19870217, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1985-805672 19851206.

AB A method is described for removing H2S from a sour gaseous stream (e.g., natural gas) by contacting the gas stream with a polyvalent metal chelate in an aq. alk. scrubbing soln., including the regeneration of the polyvalent metal chelate in an **electrolytic cell** and automatic control of the pH of the aq. alk. scrubbing soln. at 7-9 using the electrolytically generated OH-. The invention was carried out using an aq. soln. of an Fe(III)-HEDTA complex which contains K2HPO4 and Na2B4O7 to maintain pH at 8.7. H2S was introduced at 1 in.3/min, and the scrubbing soln. was regenerated in an **electrochem. cell** contg. a Nafion 324 membrane. Over 2 h under a N atm. in the contact zone, 25 g S was collected and the pH was maintained at 8.7.

IT **7439-89-6D**, Iron, chelate complexes with amino carboxylic acids **7439-96-5D**, chelate complexes with amino carboxylic acids **7439-98-7D**, Molybdenum, chelate complexes with amino carboxylic acids **7440-02-0D**, Nickel, chelate complexes with amino carboxylic acids **7440-05-3D**, Palladium, chelate complexes with amino carboxylic acids **7440-06-4D**, Platinum, chelate complexes with amino carboxylic acids **7440-47-3D**, Chromium, chelate complexes with amino carboxylic acids **7440-48-4D**, Cobalt, chelate complexes with amino carboxylic acids **7440-50-8D**, Copper, chelate complexes with amino carboxylic acids **7440-62-2D**, Vanadium, chelate complexes with amino carboxylic acids
(**oxidn.** of **hydrogen** sulfide from gas streams by)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7439-98-7 HCA
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-47-3 HCA
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-62-2 HCA
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM C01B017-16
ICS C01B031-20; C25B001-02
INCL 423226000
CC 51-5 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 48
ST hydrogen sulfide scrubbing pH control; metal chelate polyvalent **hydrogen** sulfide **oxidn**; iron chelate **hydrogen** sulfide **oxidn**
IT Amino acids, reactions
(chelation by, of polyvalent metals, for **oxidn**. of **hydrogen** sulfide from gas streams)
IT 1330-43-4 7758-11-4, Dipotassium **phosphate**
(buffer, in scrubbing liquors for **oxidn**. of **hydrogen** sulfide from gas streams, contg. polyvalent metal chelates)
IT 67053-88-7, Nafion 324
(**electrochem. cell** contg., for regeneration of polyvalent metal chelates in scrubbing liquor, for hydrogen sulfide removal from gas streams)
IT 7704-34-9P, Sulfur, preparation

(formation of, by **hydrogen** sulfide **oxidn.**
using polyvalent metal chelates, pH control in)

IT 60-00-4D, Ethylenediaminetetraacetic acid, chelate complexes with polyvalent transition metals 150-39-0D, chelate complexes with polyvalent transition metals 150-39-0D, iron complex **7439-89-6D**, Iron, chelate complexes with amino carboxylic acids **7439-96-5D**, chelate complexes with amino carboxylic acids **7439-98-7D**, Molybdenum, chelate complexes with amino carboxylic acids **7440-02-0D**, Nickel, chelate complexes with amino carboxylic acids **7440-05-3D**, Palladium, chelate complexes with amino carboxylic acids **7440-06-4D**, Platinum, chelate complexes with amino carboxylic acids 7440-31-5D, Tin, chelate complexes with amino carboxylic acids **7440-47-3D**, Chromium, chelate complexes with amino carboxylic acids **7440-48-4D**, Cobalt, chelate complexes with amino carboxylic acids **7440-50-8D**, Copper, chelate complexes with amino carboxylic acids **7440-62-2D**, Vanadium, chelate complexes with amino carboxylic acids
(**oxidn.** of **hydrogen** sulfide from gas streams by)

L68 ANSWER 16 OF 18 HCA COPYRIGHT 2006 ACS on STN

104:158155 Use of gas depolarized anodes for the electrochemical production of adiponitrile. Trocciola, John C. (United Technologies Corp., USA). U.S. US 4566957 A 19860128, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1984-680405 19841210.

AB A low-energy process for the hydrodimerization of acrylonitrile to adiponitrile resulting in an anode voltage requirement of <400 mV at 100 mA/cm2 of electrode area is described. The gas depolarizing anode comprises a mixt. of a fluorocarbon polymer binder, a noble metal (e.g. Pt) **catalyst**, and a conductive electrode substrate such as C paper, stainless steel, C steel, or Ni. The reductant can be H_2, reformed gas, CH_3OH, and coal gasifier effluent, and the electrolyte an aq. soln. of Na_2HPO_4, $Na_2B_2O_7$, and ethyldibutylammonium **phosphate.**

IT **1333-74-0**, uses and miscellaneous
(anodic depolarizer, for electrohydrodimerization of acrylonitrile to adiponitrile)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7440-06-4**, uses and miscellaneous
(**catalysts**, in gas depolarized anode for hydrodimerization of acrylonitrile to adiponitrile)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-02-0**, uses and miscellaneous
(electrodes, paper, for hydrodimerization of acrylonitrile to adiponitrile)
RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT **7782-44-7P**, preparation
(generation of, in electrohydrodimerization of acrylonitrile to adiponitrile, hydrogen depolarized anode in relation to)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C25B003-00
INCL 204-73A
CC 72-4 (Electrochemistry)
Section cross-reference(s): 23, 51
IT **Electrolytic cells**
(for hydrodimerization of acrylonitrile to adiponitrile)
IT Dimerization **catalysts**
(electrochem., conductive, noble metals, for acrylonitrile)
IT Transition metals, uses and miscellaneous
(noble, **catalysts**, for electrohydrodimerization of acrylonitrile)
IT 67-56-1, uses and miscellaneous **1333-74-0**, uses and miscellaneous
(anodic depolarizer, for electrohydrodimerization of acrylonitrile to adiponitrile)
IT **7440-06-4**, uses and miscellaneous
(**catalysts**, in gas depolarized anode for hydrodimerization of acrylonitrile to adiponitrile)
IT **7440-02-0**, uses and miscellaneous 7440-44-0, uses and miscellaneous 11121-90-7, uses and miscellaneous 12597-68-1, uses and miscellaneous
(electrodes, paper, for hydrodimerization of acrylonitrile to adiponitrile)
IT **7782-44-7P**, preparation
(generation of, in electrohydrodimerization of acrylonitrile to

adiponitrile, hydrogen depolarized anode in relation to)

L68 ANSWER 17 OF 18 HCA COPYRIGHT 2006 ACS on STN
97:171192 Improved photoanodes for photoelectrolysis. Richardson, P.; Ang, P.; Sammells, A. (Inst. Gas Technol., IIT Cent., Chicago, IL, USA). Advances in Hydrogen Energy, 3(Hydrogen Energy Prog. 4, Vol. 2), 805-19 (English) 1982. CODEN: AHENDB. ISSN: 0276-2412.
AB Photocurrents of the oxide semiconductors n-type TiO_2 and n-type Fe oxide in aq. electrolyte were improved by deposition of an O evolution **catalyst** Pt, Rh onto the semiconductor. In addn., the photocurrents of TiO_2 can also be improved by optimization of the carrier d. of the electrode upon passing sequences of anodic and cathodic currents. A neg. shift in flatband potential is demonstrated for TiO_2 in the presence of dextrose in the electrolyte soln.
IT **7440-06-4**, uses and miscellaneous **7440-16-6**, uses and miscellaneous
(cathodes, deposited on iron oxide or titanium oxide, for photoelectrochem. anode for oxygen evolution)
RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

CC 72-2 (Electrochemistry)
Section cross-reference(s): 67, 74, 76
ST anode photoelectrochem oxygen evolution; platinum **catalyst** photoelectrochem oxygen evolution; rhodium **catalyst** photoelectrochem oxygen evolution; titania photoanode **catalyst** oxygen evolution; iron oxide photoanode **catalyst** oxygen; dextrose flatband potential titania; flatband potential iron titanium oxide
IT Electric **capacitance**
(potential relations with, of iron oxide and titanium oxide, additive effect on)
IT Anodes
(photoelectrochem., iron oxide and titanium oxide, with deposited platinum and rhodium **catalysts** for oxygen evolution)
IT Oxidation **catalysts**
(photoelectrochem., platinum and rhodium, for oxygen evolution)
IT **7440-06-4**, uses and miscellaneous **7440-16-6**, uses

and miscellaneous
(cathodes, deposited on iron oxide or titanium oxide, for photoelectrochem. anode for oxygen evolution)
IT 7558-80-7
(elec. flatband potential and elec. **capacitance** of titanium oxide in dextrose-contg. soln. of)
IT 50-99-7, properties
(elec. flatband potential and elec. **capacitance** of titanium oxide in sodium **phosphate** contg.)
IT 7782-44-7P, preparation
(evolution of, iron oxide and titanium oxide with deposited rhodium or platinum **catalysts** for photoelectrochem. anodes for)

L68 ANSWER 18 OF 18 HCA COPYRIGHT 2006 ACS on STN
61:77448 Original Reference No. 61:13531b-d Titanium dioxide pigments. Whately, Walter R. (American Cyanamid Co.). US 3141788 19640721, 4 pp. (Unavailable). APPLICATION: US 19621005.
AB **Hydrous** Zr **phosphates** are pptd. as gels or gelatinous ppts. onto the surface of TiO_2 pigments to produce pigments of improved chalk resistance. Thus, a slurry contg. 20% by wt. futile TiO_2 pigment is warmed to 30° and a 4,000 g. aliquot is removed. To this is added 40 ml. of a soln. contg. $Zr(SO_4)_2$ in an amt. equiv. to 200 g. ZrO_2/1., followed by a slow addn. with rapid stirring of 56 ml. of an aq. soln. contg. 100 g. H_3PO_4/1. The Zr of the $Zr(SO_4)_2$ is pptd. as a **hydrous** Zr **phosphate.** The slurry is then neutralized to pH 8.0 with NaOH and the liquid phase is filtered off. The resulting pigment cake is washed to remove Na_2SO_4 and any other sol. salts present, oven-dried at 110° and milled in a fluid-energy mill supplied with superheated steam. The chalk resistance of paint contg. the treated pigment is >2 times as high as that of paint contg. the control pigment.
INCL 106300000
CC **52** (Coatings, Inks, and Related Products)
IT Coating(s)
(of pigments (TiO_2), with **hydrous** Zr **phosphate** for chalking resistance)
IT Pigments
(titanium dioxide, chalking resistant **hydrous** Zr **phosphate** - coated)

=> d l70 1-10 cbib abs hitstr hitind

L70 ANSWER 1 OF 10 HCA COPYRIGHT 2006 ACS on STN
144:54460 **Fuel cells** using gas diffusion electrodes.
(Sartorius AG, Germany). Ger. Gebrauchsmusterschrift DE

202005010403 U1 20051222, 12 pp. (German). CODEN: GGXXFR.
APPLICATION: DE 2005-202005010403 20050702. PRIORITY: DE
2004-102004032999 20040708.

AB Gas diffusion electrodes with several gas-permeable, elec. conductive layers, which consist at least of a gas diffusion layer and a **catalyst** layer, whereby the **catalyst** layer contains at least particles of an elec. conductive substrate, and at least one part of the particles carries an electrocatalyst and/or at least partly loaded with ≥1 porous proton-conductive polymer, and this proton-conductive polymer is applicable at temps. to above the b.p. of water.

IT **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses
(**fuel cells** using gas diffusion electrodes)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

IT **7439-98-7D**, Molybdenum, oxo-acid deriv. **7440-33-7D**, Tungsten, oxo-acid deriv. **7440-47-3D**, Chromium, oxo-acid deriv.
(**fuel cells** using gas diffusion electrodes)

RN 7439-98-7 HCA

CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-33-7 HCA

CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-47-3 HCA

CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IC ICM H01M004-86
ICS H01M004-64; H01M004-88; H01M004-92; H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **fuel cell** use gas diffusion electrode
IT Acid halides
(acid chlorides; **fuel cells** using gas diffusion electrodes)
IT **Catalysts**
(electrocatalysts; **fuel cells** using gas diffusion electrodes)
IT Conducting polymers
(**fuel cells** using gas diffusion electrodes)
IT Alloys, uses
Metals, uses
Oxides (inorganic), uses
(**fuel cells** using gas diffusion electrodes)
IT Polybenzimidazoles
(**fuel cells** using gas diffusion electrodes)
IT Polybenzothiazoles
(**fuel cells** using gas diffusion electrodes)
IT Polybenzoxazoles
(**fuel cells** using gas diffusion electrodes)
IT Polyoxadiazoles
(**fuel cells** using gas diffusion electrodes)
IT Polyquinoxalines
(**fuel cells** using gas diffusion electrodes)
IT Amides, uses
(**fuel cells** using gas diffusion electrodes)
IT Carbon black, uses
(**fuel cells** using gas diffusion electrodes)
IT Esters, uses
(**fuel cells** using gas diffusion electrodes)
IT **Fuel cell** electrodes
(gas diffusion; **fuel cells** using gas diffusion electrodes)
IT Carbides
(metal; **fuel cells** using gas diffusion electrodes)
IT Polymers, uses
(nitrogen-contg.; **fuel cells** using gas diffusion electrodes)
IT **Fuel cells**
(polymer **electrolyte**; **fuel cells** using gas diffusion electrodes)
IT **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses
(**fuel cells** using gas diffusion electrodes)

IT 127-19-5, Dimethyl acetamide 129-00-0D, Pyrene, aza derivs., polymers 7440-44-0, Carbon, uses 25013-01-8, Polypyridine 82370-43-2, Polyimidazole 128611-69-8 190201-51-5
(**fuel cells** using gas diffusion electrodes)

IT 78-10-4, Teos 298-07-7, 2-(Diethylhexyl)**phosphate** 2425-79-8, 1,4-Butanediol diglycidyl ether 7439-92-1D, Lead, oxo-acid deriv. **7439-98-7D**, Molybdenum, oxo-acid deriv. 7440-21-3D, Silicon, oxo-acid deriv. 7440-31-5D, Tin, oxo-acid deriv. **7440-33-7D**, Tungsten, oxo-acid deriv. 7440-36-0D, Antimony, oxo-acid deriv. 7440-38-2D, Arsenic, oxo-acid deriv. 7440-42-8D, Boron, oxo-acid deriv. **7440-47-3D**, Chromium, oxo-acid deriv. 7440-56-4D, Germanium, oxo-acid deriv. 7440-69-9D, Bismuth, oxo-acid deriv. 7664-38-2, Phosphoric acid, uses 7704-34-9D, Sulfur, oxo-acid deriv. 7723-14-0D, Phosphorus, oxo-acid deriv. 7782-49-2D, Selenium, oxo-acid deriv. 17524-05-9, Molybdenyl acetylacetonate
(**fuel cells** using gas diffusion electrodes)

L70 ANSWER 2 OF 10 HCA COPYRIGHT 2006 ACS on STN

143:463153 Proton-conductive membranes, **catalyst** electrode-proton conductor assemblies, and **fuel cells**. Matsuo, Kazumine; Kin, Shinichiro; Sano, Hiroki; Omichi, Takahiro (Teijin Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2005320472 A2 20051117, 21 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2004-140958 20040511.

AB The H+-conductive membranes are obtained by hydrolysis and condensation of amino-contg. Si alkoxides, amino-free Si alkoxides, metal alkoxides contg. Ti, Al, and/or Zr, and **phosphate** compds. or phosphite compds. to prep. a 1st soln. contg. metal oxide derivs., adding the 1st soln. to a soln. contg. H+-conductive org. polymers having T (temp. where main dispersion of mol. chains is obsd. by dynamic viscoelastic measurement) 60-270° to prep. a 2nd soln. contg. the H+-conductive org. polymers and metal oxide derivs., and casting the 2nd soln., and show ≤90% decrease in storage modulus at T(°) compared to that at 30°. The **catalyst** electrode-proton conductor assemblies have **catalyst** electrodes comprising metals supported on elec. conductive particulate carriers on both sides of the H+-conductive membranes. The H+-conductive membranes are MeOH-insol., show good film-forming properties and H+ cond., suppress crossover of MeOH, and are useful for direct-methanol polymer **electrolyte fuel cells**.

IT **7440-06-4**, Platinum, uses
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-67-7D**, Zirconium, alkoxides
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte** **fuel cells**)
RN 7440-67-7 HCA
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IC ICM C08J005-22
ICS C08G077-26; C08K003-00; C08L071-08; C08L081-06; H01B001-06; H01M008-02; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 67, 72
ST metal oxide org polymer proton conductor; **fuel cell electrolyte** oxide polymer **phosphate** ; **catalyst** electrode polymer **electrolyte** **fuel cell**; direct methanol **fuel cell electrolyte** polymer
IT Titanates
Zirconates
(alkoxides; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte** **fuel cells**)
IT Silanes
(alkoxy; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte** **fuel cells**)
IT Metal alkoxides
(aluminum; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte** **fuel cells**)
IT **Catalysts**
(electrocatalysts; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte** **fuel cells**)
IT Polyketones

Polysulfones, uses
(polyether-, sulfonated; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Polyethers, uses
(polyketone-, sulfonated; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT **Fuel cells**
(polymer **electrolyte**; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Ionic conductors
(polymeric; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Polyethers, uses
(polysulfone-, sulfonated; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Electric conductors
Fuel cell electrodes
Fuel cell electrolytes
Interpenetrating polymer networks
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Oxides (inorganic), uses
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT **Phosphates**, uses
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Phosphites
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Metal alkoxides
(titanium; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT Metal alkoxides
(zirconium; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT 7440-44-0, Carbon, uses
(**catalyst** support; proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT **7440-06-4**, Platinum, uses
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

IT 7429-90-5D, Aluminum, alkoxides **7440-67-7D**, Zirconium, alkoxides 7664-38-2, Phosphoric acid, uses 13598-36-2, Phosphorous acid, uses 871682-28-9 871682-29-0
(proton-conductive membranes contg. org. polymers and metal oxides for **catalyst** electrode-proton conductor assemblies and direct-methanol polymer **electrolyte fuel cells**)

L70 ANSWER 3 OF 10 HCA

143:232710 Membrane-electrode assembly containing peroxide decomposition **catalyst** for polymer **electrolyte fuel cell**. Takeshita, Tomohiro; Miura, Fusami; Morimoto, Tomo; Kobayashi, Masashi; Kato, Manabu; Takeuchi, Norimitsu (Toyota Central Research and Development Laboratories Inc., Japan; Toyota Motor Corp.). Jpn. Kokai Tokkyo Koho JP 2005235437 A2 20050902, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2004-40103 20040217.

AB The claimed assembly, consisting of a pair of electrodes placed on both sides of an ion conductive electrolyte membrane, is equipped with a peroxide-decompg. **catalyst** having concn. gradient in ≥1 of the electrodes. The resulting **fuel cell** is suppressed from deterioration of the electrode and the membrane film.

IT **7440-18-8**, Ruthenium, uses **7440-22-4**, Silver, uses
(**catalysts**; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)

RN 7440-18-8 HCA

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

IC ICM H01M004-86
ICS H01M004-90; H01M004-92; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 67
ST peroxide decompn **catalyst** membrane electrode assembly polymer **fuel cell**
IT Polyoxyalkylenes, uses
(fluorine- and sulfo-contg., ionomers, Nafion, electrolyte membranes; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)
IT Decomposition **catalysts**
Fuel cell electrodes
(membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)
IT **Fuel cells**
(polymer **electrolyte**; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)
IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-contg., ionomers, Nafion, electrolyte membranes; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)
IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-contg., Nafion, electrolyte membranes; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)
IT Peroxides, processes
(removal of; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)
IT 1306-38-3, Ceria, uses 1314-35-8, Tungsten trioxide, uses 1317-61-9, Iron oxide (Fe3O4), uses **7440-18-8**, Ruthenium, uses **7440-22-4**, Silver, uses 7758-88-5, Cerium

trifluoride 7783-50-8, Ferric fluoride 7784-30-7, Aluminum **phosphate** 7789-04-0, Chromium **phosphate** CrPO4
9001-05-2, Catalase 10045-86-0, Ferric **phosphate**
12036-10-1, Ruthenium dioxide 13454-72-3 14875-96-8, Heme
15213-42-0, Iron porphyrin 15612-49-4, Cobalt porphyrin
(**catalysts**; membrane-electrode assembly with electrode contg. peroxide decompn. **catalyst** for polymer **electrolyte fuel cell**)

L70 ANSWER 4 OF 10 HCA COPYRIGHT 2006 ACS on STN
140:202303 Electrode modified with platinum microparticles prepared by molecular imprinting technology and electrocatalytic oxidation of methanol. Guo, Fu-qiang; Fang, Cheng; Zhou, Xing-yao (College of Chemistry and Molecular Sciences, Wuhan University, Wuhan, 430072, Peop. Rep. China). Fenxi Kexue Xuebao, 19(4), 324-326 (Chinese) 2003. CODEN: FKXUFZ. ISSN: 1006-6144. Publisher: Fenxi Kexue Xuebao Bianjibu.

AB The electrocatalytic oxidn. of MeOH on a Pt microparticle electrode, prepd. through mol. imprinting technol. which deposited Pt microparticles on a self-assembled monolayer of glutathione (GSH), was studied by cyclic voltammetry. The modified electrode exhibited high electrocatalytic activity for oxidn. of MeOH and it depended on the Pt loading capacity, the pH of electrolytes and the environment of a Pt-particle on the electrode surface.

IT **7440-06-4**, Platinum, uses
(**fuel cell** anode modified with platinum microparticles prepd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-57-5**, Gold, uses
(in **fuel cell** anode modified with platinum microparticles prepd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

IT **Fuel cell** anodes
Oxidation, **electrochemical**

(**fuel cell** anode modified with platinum microparticles prepd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT 70-18-8, Glutathione, uses
(**catalyst** support; for **fuel cell** anode modified with platinum microparticles prepd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT 1310-73-2, Sodium hydroxide (NaOH), uses 7558-80-7, Sodium **phosphate** (NaH2PO4) 7664-93-9, Sulfuric acid, uses
(**fuel cell** anode modified with platinum microparticles for electrocatalytic oxidn. of methanol with electrolyte soln. contg.)

IT **7440-06-4**, Platinum, uses
(**fuel cell** anode modified with platinum microparticles prepd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT 67-56-1, Methanol, processes
(**fuel cell** anode modified with platinum microparticles prepd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

IT **7440-57-5**, Gold, uses
(in **fuel cell** anode modified with platinum microparticles prepd. by mol. imprinting technol. for electrocatalytic oxidn. of methanol)

L70 ANSWER 5 OF 10 HCA COPYRIGHT 2006 ACS on STN

138:26768 A quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes. Li, Qingfeng; Hjuler, H. A.; Hasiotis, C.; Kallitsis, J. K.; Kontoyannis, C. G.; Bjerrum, N. J. (Materials Science Group, Department of Chemistry, Technical University of Denmark, Lyngby, DK-2800, Den.). Electrochemical and Solid-State Letters, 5(6), A125-A128 (English) 2002. CODEN: ESLEF6. ISSN: 1099-0062. Publisher: Electrochemical Society.

AB From a polymer electrolyte blend of polybenzimidazole and sulfonated polysulfone, a polymer **electrolyte** membrane **fuel cell** was developed with an operational temp. up to 200°. Due to the high operational temp., the **fuel cell** can tolerate 1.0-3.0 vol.% CO in the fuel, compared to <100 ppm CO for the Nafion-based technol. at 80°. The high CO tolerance makes it possible to use the reformed hydrogen directly from a simple methanol reformer without further CO removal. That both the **fuel cell** and the methanol reformer operate at temps. around 200° opens the possibility for an integrated system. The resulting system is expected to exhibit high power d. and simple construction as well as efficient capital and operational cost.

IT **7440-06-4**, Platinum, uses
(anode **catalyst**, cast onto carbon paper; quasi-direct

methanol **fuel cell** system based on blend
polymer membrane electrolytes)
RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-50-8**, Copper, uses
(copptd.; methanol reforming **catalyst** for **fuel**
cell system based on blend polymer membrane electrolytes)
RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST methanol reforming **hydrogen fuel cell**
blend polymer membrane electrolyte; polybenzimidazole sulfonated
polysulfone blend **phosphate** dopant electrolyte membrane
IT Reforming **catalysts**
(for methanol; quasi-direct methanol **fuel cell**
system based on blend polymer membrane electrolytes)
IT Electric current-potential relationship
(methanol reforming **catalyst** for **fuel**
cell system based on blend polymer membrane electrolytes)
IT **Fuel cell electrolytes**
(polymer **electrolytes**; quasi-direct methanol
fuel cell system based on blend polymer
membrane electrolytes)
IT **Fuel cell** electrodes
Polymer electrolytes
(quasi-direct methanol **fuel cell** system based
on blend polymer membrane electrolytes)
IT Polymer blends
(solid electrolytes; quasi-direct methanol **fuel**
cell system based on blend polymer membrane electrolytes)
IT Polysulfones, uses
(sulfonated, sodium salts, blend with polybenzimidazole and
phosphoric acid; quasi-direct methanol **fuel**
cell system based on blend polymer membrane electrolytes)
IT Carbon black, uses
(support for platinum anode **catalyst**, cast onto carbon
paper; quasi-direct methanol **fuel cell** system
based on blend polymer membrane electrolytes)
IT **7440-06-4**, Platinum, uses

(anode **catalyst**, cast onto carbon paper; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 25734-65-0
(blends with sulfonated polysulfones and phosphoric acid; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 291280-30-3, TGP-H 120
(carbon paper support for platinum-carbon **catalyst**; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 630-08-0, Carbon monoxide, uses
(**catalyst** poison, tolerance to; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 1314-13-2, Zinc oxide, uses 1344-28-1, Alumina, uses
7440-50-8, Copper, uses
(copptd.; methanol reforming **catalyst** for **fuel cell** system based on blend polymer membrane electrolytes)

IT 1333-74-0, Hydrogen, uses
(formation and oxidn. of; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 7664-38-2D, Phosphoric acid, compd. with polybenzimidazole and sodium sulfonated polysulfone
(polymer electrolyte dopant; quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

IT 67-56-1, Methanol, uses
(quasi-direct methanol **fuel cell** system based on blend polymer membrane electrolytes)

L70 ANSWER 6 OF 10 HCA COPYRIGHT 2006 ACS on STN

137:157160 Method and apparatus for gas purification in energy conversion systems. Grieve, Malcolm James; Weissman, Jeffrey G.; Mukerjee, Subhasish (Delphi Technologies, Inc., USA). Eur. Pat. Appl. EP 1231663 A1 20020814, 16 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2002-75103 20020114. PRIORITY: US 2001-781687 20010212.

AB A reformate gas generating device for an energy conversion device comprises a trapping system comprising a filter element and a trap element, and a reforming system. The reforming system is coupled to the trapping system, which is positioned after the reforming system. The trapping system is monitored by a combination of devices including an on-board diagnostic system, a temp. sensor, and a pressure differential sensor, which can individually or in combination det. when to regenerate the trapping system. The method for trapping sulfur and particulate matter using the trapping system

comprises dispensing fuel into the energy conversion device. The fuel is processed in a reformer system to produce a reformate. The reformate is introduced into the trapping system and filtered to remove particulate matter and sulfur.

IT **7439-96-5**, Manganese, uses **7440-50-8**, Copper, uses **7440-66-6**, Zinc, uses
(S adsorbent; method and app. for gas purifn. in energy conversion systems)

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-66-6 HCA
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **7439-89-6**, Iron, uses **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-16-6**, Rhodium, uses **7440-25-7**, Tantalum, uses **7440-33-7**, Tungsten, uses **7440-48-4**, Cobalt, uses **7440-62-2**, Vanadium, uses
(method and app. for gas purifn. in energy conversion systems)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-98-7 HCA
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-03-1 HCA
CN Niobium (8CI, 9CI) (CA INDEX NAME)

Nb

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-25-7 HCA
CN Tantalum (8CI, 9CI) (CA INDEX NAME)

Ta

RN 7440-33-7 HCA
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-62-2 HCA
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M008-06
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 47
ST energy conversion system gas purifn app; **fuel cell** reformate purifn trapping system
IT Alloys, uses
Carbonates, uses
Molybdates
Phosphates, uses
Scapolite-group minerals
Zeolites (synthetic), uses
(S adsorbent; method and app. for gas purifn. in energy conversion systems)
IT Adsorbents
Catalysts
Energy
Filters
Fuel cells
Particles
Reforming apparatus
Temperature sensors
Trapping apparatus
Valves
(method and app. for gas purifn. in energy conversion systems)
IT **Fuel cells**
(solid **electrolyte**; method and app. for gas purifn. in energy conversion systems)
IT 1302-90-5, Sodalite **7439-96-5**, Manganese, uses **7440-50-8**, Copper, uses **7440-66-6**, Zinc, uses
(S adsorbent; method and app. for gas purifn. in energy conversion systems)
IT **7439-89-6**, Iron, uses **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-03-1**, Niobium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-16-6**, Rhodium, uses **7440-25-7**, Tantalum, uses **7440-33-7**, Tungsten, uses **7440-48-4**, Cobalt, uses **7440-62-2**, Vanadium, uses
(method and app. for gas purifn. in energy conversion systems)

L70 ANSWER 7 OF 10 HCA COPYRIGHT 2006 ACS on STN
136:153925 Hydrogen permeable membrane for use in **fuel cells**, and partial reformate **fuel cell** system having reforming **catalysts** in the anode **fuel cell** compartment. Smotkin, Eugene S. (Nuvant Systems, LLC, USA). PCT Int. Appl. WO 2002011226 A2 20020207, 58

pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US20032 20010622. PRIORITY: US 2000-222128P 20000731; US 2000-244208P 20001031.

AB An electronically insulating proton conductor is adhered or deposited as a film on a dense phase proton permeable material in a thickness such that the composite C/D has a proton cond. in a preferred intermediate temp. range of 175-550°. The composite C/D is incorporated in a high temp. electrolyte membrane electrolyte assembly (MEA), which is incorporated into a **fuel cell** that can operate in this intermediate temp. range. The **fuel cell** in turn is incorporated into a **fuel cell** system having a fuel reformer in the flow field of a fuel mixt. entering the **fuel cell** or in a mode where the **fuel cell** receives **fuel** from an external reformer.

IT **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-32-6**, Titanium, uses **7440-62-2**, Vanadium, uses
(hydrogen permeable membrane for use in **fuel cells** and partial reformate **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-62-2 HCA

CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **fuel cell hydrogen** permeable membrane;
reforming **catalyst** anode **fuel cell**
compartment
IT Electric conductors
Fuel cell anodes
Fuel cell electrolytes
Fuel cells
Membranes, nonbiological
Reforming **catalysts**
Synthesis gas manufacturing
Water gas shift reaction
(**hydrogen** permeable membrane for use in **fuel**
cells and partial reformate **fuel cell**
system having reforming **catalysts** in anode **fuel**
cell compartment)
IT Polyphosphates
(hydrogen permeable membrane for use in **fuel**
cells and partial reformate **fuel cell**
system having reforming **catalysts** in anode **fuel**
cell compartment)
IT Hydrides
(hydrogen permeable membrane for use in **fuel**
cells and partial reformate **fuel cell**
system having reforming **catalysts** in anode **fuel**
cell compartment)
IT Ionic conductors
(protonic; hydrogen permeable membrane for use in **fuel**
cells and partial reformate **fuel cell**
system having reforming **catalysts** in anode **fuel**
cell compartment)
IT Fuel gas manufacturing
(reforming; hydrogen permeable membrane for use in **fuel**
cells and partial reformate **fuel cell**
system having reforming **catalysts** in anode **fuel**
cell compartment)
IT Palladium alloy, base
(hydrogen permeable membrane for use in **fuel**
cells and partial reformate **fuel cell**
system having reforming **catalysts** in anode **fuel**
cell compartment)
IT **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses

7440-32-6, Titanium, uses **7440-62-2**, Vanadium, uses 12023-04-0, Feti 12196-72-4 18649-05-3, Cesium Dihydrogen **phosphate** 153328-13-3D, Strontium yttrium zirconium oxide SrY0.1Zr0.9O3, O-deficient 191980-68-4, Barium calcium niobium oxide Ba3Ca1.18Nb1.82O8.73 251566-28-6, Lanthanum magnesium scandium strontium oxide La0.9Mg0.1Sc0.9Sr0.1O3 395656-87-8D, Barium cerium gadolinium zirconium oxide (BaCe0.5-0.9Gd0.1Zr0-0.4O3), O-deficient 395656-88-9
(hydrogen permeable membrane for use in **fuel cells** and partial reformate **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

IT 1333-74-0P, Hydrogen, uses
(hydrogen permeable membrane for use in **fuel cells** and partial reformate **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

IT 67-56-1, Methanol, uses
(hydrogen permeable membrane for use in **fuel cells** and partial reformate **fuel cell** system having reforming **catalysts** in anode **fuel cell** compartment)

L70 ANSWER 8 OF 10 HCA COPYRIGHT 2006 ACS on STN

136:40187 Synthesis of electrocatalyst powders containing conducting fluoropolymers for use in **batteries** and **fuel cells**. Kodas, Toivo T.; Hampden-Smith, Mark J.; Atanassova, Paolina; Atanassov, Plamen; Kunze, Klaus; Napolitano, Paul; Dericotte, David; Bhatia, Rimple (Superior Micropowders Llc, USA). PCT Int. Appl. WO 2001093999 A2 20011213, 154 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US18565 20010608. PRIORITY: US 2000-589710 20000608; US 2001-815380 20010322.

AB Powd. metal oxide or metal electrocatalysts, esp. for use in proton-exchange-membrane **fuel cells**, are prepd. by atomizing a metal precursor-contg. liq. into precursor droplets followed by heating the droplets to .ltorsim.700° (preferably .ltorsim.400°) to form the electrocatalytic particles, which are then collected. Atomization is typically carried out in an ultrasonic aerosol generator. The electrocatalysts can be unsupported or supported (preferably on carbon or carbon black, with

surface area .gtorsim.400 m2/g); the **catalyst** particles have a bimodal size distribution with a vol. av. particle size of 1-10 μ, with an av. size for the active phase of .ltorsim.4 nm. The active powders can also contain a proton-conducting org. polymer, such as a perfluorocarbon polymer contg. sulfate and **phosphate** functional groups. Such electrocatalysts are useful for use in energy devices, such as **batteries** or **fuel cells** (esp. proton-exchange-membrane, direct MeOH, alk., and phosphoric acid **fuel cells**).

IT **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses **7440-22-4**, Silver, uses
(electrocatalyst particles contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

IC ICM B01J
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 67
ST **fuel cell** electrocatalyst powder decompn; **battery** electrocatalyst powder decompn; manganese nickel cobalt platinum electrocatalyst powder; proton conducting fluoropolymer metal electrocatalyst prepn
IT Surfactants
(anionic; in synthesis of electrocatalyst powders contg.

conducting fluoropolymers for use in **batteries** and
fuel cells)

IT Carbon black, uses
(**catalyst** support, electrocatalysts contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT Fluoropolymers, uses
(conducting fluoropolymer; in synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT **Fuel cells**
Primary **batteries**
Secondary **batteries**
(electrocatalysts for; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT **Catalysts**
(electrocatalysts, for **fuel cells**; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT Fluoropolymers, uses
(functionalized, electrocatalysts contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT Surfactants
(in synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT Ionic conductors
(proton conductors, functionalized fluoropolymers; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT **Phosphate** group
(proton-conducting fluoropolymers contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT Conducting polymers
(proton-conducting functionalized fluoropolymers; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT Functional groups
(sulfate, proton-conducting fluoropolymers contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT Aerosols
(synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
(**catalyst** support, electrocatalysts contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)
IT 15520-84-0, Cobalt nitrate (Co(NO3)3)
(cobalt source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)
IT 9002-84-0, PTFE 163294-14-2, Nafion 112
(conducting fluoropolymer; in synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)
IT 1313-13-9, Manganese dioxide, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses **7440-22-4**, Silver, uses 11129-60-5, Manganese oxide 12737-30-3, Cobalt nickel oxide
(electrocatalyst particles contg.; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)
IT 7722-64-7, Potassium permanganate 10377-66-9, Manganese nitrate
(manganese source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)
IT 13138-45-9, Nickel nitrate (Ni(NO3)2)
(nickel source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)
IT 20634-12-2, Tetraammineplatinum dinitrate 51850-20-5
(platinum source; synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)
IT 9002-93-1, Triton X-405
(surfactant; in synthesis of electrocatalyst powders contg. conducting fluoropolymers for use in **batteries** and **fuel cells**)

L70 ANSWER 9 OF 10 HCA COPYRIGHT 2006 ACS on STN
123:291707 Electrodeposition of PbO2 film for **catalytic** activity anode material. Danilov, F. J.; Velichenko, A. B.; Girenko, D. V. (Dep. Physical Chem., Ukrainian State Chemical Technical Univ., Dniepropetrovsk, 320005, Ukraine). New Materials for Fuel Cell Systems I, Proceedings of the International Symposium on New Materials for Fuel Cell Systems, 1st, Montreal, July 9-13, 1995, 702-9. Editor(s): Savadogo, Oumarou; Roberge, P. R.; Veziroglu, T. N. Editions de lEcole Polytechnique de Montreal: Montreal, Que. (English) 1995. CODEN: 61XHAF.
AB The electrodeposition of PbO2 from HClO4 solns. of Pb(II) at Au and Pt rotating electrode was studied as a function of applied potential

and rotational velocity and with and without sulfate and **phosphate** ion addns. Exptl. data showed that the process of PbO2 formation has several stages. The first stage is the formation of oxygen contg. particles as OHads, chemisorbed on the electrode. At the following chem. stage, these particles interact with lead compds. forming sol. intermediate product Pb(OH)2+ which is oxidized electrochem. forming PbO2.

IT **7440-06-4**, Platinum, uses **7440-57-5**, Gold, uses
(electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

ST lead dioxide film electrodeposition rotating electrode; **fuel cell** anode lead dioxide electrodeposition; electrochem sensor anode lead dioxide electrodeposition

IT Electrodeposition and Electroplating
(of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

IT Sensors
(electrochem., anodes; electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

IT Anodes
(**fuel-cell**, electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

IT Electrodes
(rotating, electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel**

cells and **electrochem.** sensors)

IT **7440-06-4**, Platinum, uses **7440-57-5**, Gold, uses
(electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

IT 1309-60-0, Lead dioxide
(electrodeposition of lead dioxide film from perchloric acid solns. at gold and platinum rotating electrodes for **catalytic** activity anode material for **fuel cells** and **electrochem.** sensors)

L70 ANSWER 10 OF 10 HCA COPYRIGHT 2006 ACS on STN

121:16828 **Electrochemical** gas sensor **cells** using three dimensional sensing electrodes. Tomantschger, Klaus; Janis, Allan A.; Weinberg, Norman L.; Rait, Joseph M. (Minitech Co., USA). U.S. US 5302274 A 19940412, 15 pp. Cont.-in-part of U.S. 5,173,166. (English). CODEN: USXXAM. APPLICATION: US 1992-915263 19920720. PRIORITY: US 1990-513441 19900416.

AB The sensor cell permits quant. measurement of volatile gas contaminants (e.g., CO, H_2S, H_2, AsH_3) in an atm. being monitored. The cell comprises ≥1 sensor electrode and a counter electrode, on either side of an ion conductive electrolyte which may be immobilized in a matrix. The electrolyte may also be a solid electrolyte or a polymer electrolyte. The sensing electrode has a high surface area **catalyst** dispersed on a porous substrate, and is mounted in such a manner as to be exposed to the atm. which is to be sensed for gaseous contaminants, with the counter electrode being isolated from any exposure to that atm. Generally, the electrodes are mounted in elec. conductive frames, sandwiching a third non-conductive frame member in which the ion conductive electrolyte is substantially located. The conductive frames may comprise electronically conductive materials such as conductive polymers, ceramics, nitrides, oxides and graphites. In an alternative embodiment, a further ref. electrode may be mounted so as to be exposed to the electrolyte. The porous electrode may comprise a porous substrate or a base layer, a **catalytically** active metal, alloy, or metal oxide (usually a noble metal) dispersed in a high surface area form, carbon, and a polymeric hydrophobic binder.

IT **7439-88-5**, Iridium, uses **7439-89-6**, Iron, uses **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-48-4**, Cobalt, uses **7440-57-5**, Gold, uses
(**catalyst**, in **electrochem.** gas sensor **cells**)

RN 7439-88-5 HCA

CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IC ICM G01N027-416
INCL 204412000
CC 59-1 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 47
IT Volatile substances
(detn. of, **electrochem**. sensor **cells** for)
IT Glass, oxide
(filler, in **electrochem**. gas sensor **cells**)

IT Carbon black, uses
(in **electrochem.** gas sensor **cells**, black pearls)
IT Gas analysis
(sensor **cells** for, **electrochem.**)
IT Carbon paper
(substrate, in **electrochem.** gas sensor **cells**)
IT Textiles
(felt, in **electrochem.** gas sensor **cells**)
IT **7439-88-5**, Iridium, uses **7439-89-6**, Iron, uses **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-48-4**, Cobalt, uses **7440-57-5**, Gold, uses 11107-69-0, Platinum palladium 12610-90-1, Palladium rhodium 57887-79-3, Gold ruthenium
(**catalyst**, in **electrochem.** gas sensor **cells**)
IT 75-75-2, Methanesulfonic acid 1310-86-7 1314-23-4, Zirconia, uses 10377-51-2, Lithium iodide 12041-40-6, Potassium silver iodide (kag4i5) 12267-44-6, Rubidium silver iodide (rbag4i5) 12712-36-6, Antimonic acid 13933-56-7 14265-44-2, **Phosphate**, uses 14808-79-8, Sulfate, uses 39390-08-4, Silver tungsten iodide oxide (Ag6WI4O4) 58572-20-6, Sodium zirconium **phosphate** silicate (Na3Zr2(PO4)(SiO4)2) 118557-25-8, Lead silver iodide (pbag4i5) 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses
(electrolyte, in **electrochem.** gas sensor **cells**)
IT 11138-49-1, Sodium beta alumina
(electrolyte, of β-alumina type, in **electrochem.** gas sensor **cells**)
IT 1066-33-7, Ammonium bicarbonate 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 13463-67-7, Titanium oxide, uses
(filler, in **electrochem.** gas sensor **cells**)
IT 9002-86-2, Polyvinyl chloride 9003-07-0, Polypropylene 9003-18-3, Acrylonitrile-butadiene copolymer 9003-56-9, Acrylonitrile-butadiene-styrene copolymer 10043-11-5, Boron nitride, uses 12012-35-0, Chromium carbide (cr3c2) 12070-08-5, Titanium carbide 12070-12-1, Tungsten carbide 12137-20-1, Titanium oxide (tio) 12138-09-9, Tungsten sulfide (ws2) 12143-55-4, Titanium oxide (ti4o7) 12209-99-3, Sodium tungstate (na2wo3) 24937-79-9, Polyvinylidene difluoride 74499-90-4, Zinc carbide 1317-33-5, Molybdenum sulfide (mos2), uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses
(frame from, in **electrochem.** gas sensor **cells**)
IT 630-08-0, Carbon monoxide, analysis 1333-74-0, **Hydrogen**, analysis 7783-06-4, Hydrogen sulfide, analysis 7784-42-1, Arsine
(sensor **cells** for detn. of, electrochem.)

IT 9002-84-0, Ptfe 50808-93-0, Panex
(substrate, in **electrochem.** gas sensor **cells**)

=> d his l71-

FILE 'HCA' ENTERED AT 13:12:51 ON 17 OCT 2006

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L71          4 S L54 NOT (L19 OR L22 OR L68 OR L70)
L72          4 S L71 AND 1840-2003/PRY,PY
L73         13 S L52 NOT (L19 OR L22 OR L68 OR L70 OR L71)
L74         10 S L73 AND 1840-2003/PRY,PY
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=> d l72 1-4 cbib abs hitstr hitind

L72 ANSWER 1 OF 4 HCA COPYRIGHT 2006 ACS on STN

141:334863 Crosslinked polyoxyalkylene-polysiloxanes for use as nonaqueous salt-type electrolytes for lithium secondary **batteries**. Barrandon, Georges; George, Catherine; Vergelati, Caroll; Giraud, Yves (Rhodia Chimie, Fr.). Fr. Demande FR 2853321 A1 20041008, 25 pp. (French). CODEN: FRXXBL. APPLICATION: FR 2003-4153 20030403.

AB Crosslinked polymeric electrolytes for lithium secondary **batteries** consist of: (1) a first poly(hydrogen org. siloxane) with ≥2 Si-H bonds per mol., (2) a second polysiloxane contg. ≥2 Si-OH bonds per mol., (3) a dehydrogenation-condensation **catalyst**, and (4) ≥1 salt electrolyte. The polyoxyalkylene ether functions are derived from polyoxyethylene, polyoxypropylene, or their mono-Me ethers. The dehydrogenation-condensation **catalysts** are typically metal complexes based on Pt, B, Rh, Pd, Sn, or Ir, preferably Karstedt (hydrosilylation) **catalysts** of formula IrCl(C:O)(PPh3)2. Suitable salt electrolytes include LiClO4, LiBF4, LiAsF6, CF3SO3Li, LiN(CF3SO2)2, and LiN(C2F5SO2)2 in a non-aq. electrolyte solvent, as well as other cations (e.g., transition metal cations, selected from Mn, Fe, Co, Ni, Cu, Zn, Ca, and Ag). Addnl. ions include ammonium, amidinium, guanidinium cations, halides, ClO4-, SCN-, BF4-, NO3-, AsF6-, PF6-, RSO3- (R = stearyl, CF3, octyl, dodecylphenyl, and C1-6-perfluoroalkyl and -perfluoroaryl), (R5SO2)2N-, and (R4SO2)(R5SO2)(R6SO2)C- (R4-6 = C1-6-perfluoroalkyl and -perfluoroaryl).

IT **7439-88-5D**, Iridium, complexes **7440-05-3D**, Palladium, complexes **7440-06-4D**, Platinum, complexes **7440-16-6D**, Rhodium, complexes
(Karstedt complexes, dehydrogenation-condensation **catalysts**; crosslinked polyoxyalkylene-polysiloxanes for

use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

RN 7439-88-5 HCA
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

IT **7439-89-6DP**, Iron, salts **7439-96-5DP**, Manganese, salts **7440-02-0DP**, Nickel, salts **7440-22-4DP**, Silver, salts **7440-48-4DP**, Cobalt, salts **7440-50-8DP**, Copper, salts **7440-66-6DP**, Zinc, salts
(**battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-66-6 HCA
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IC ICM C08L083-06
ICS H01M010-26
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 37
ST crosslinked polymer electrolyte polyoxyalkylene polysiloxane lithium **battery**; nonaq **battery** polyoxyalkylene polysiloxane electrolyte; hydrosilylation condensation polyoxyalkylene polysiloxane crosslinking **battery** electrolyte; Karstedt hydrosilylation condensation polyoxyalkylene polysiloxane **battery** electrolyte
IT Onium compounds
(amidinium compds., **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)
IT Bromides, uses
Chlorides, uses
Halides
Iodides, uses
Quaternary ammonium compounds, uses
Transition metal salts

(**battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polymerization
Polymerization **catalysts**
(dehydrogenation, dehydrogenation-condensation; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Hydrosilylation
Hydrosilylation **catalysts**
(dehydrogenation-condensation; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polyoxyalkylenes, uses
(di-Me, Me hydrogen polysiloxane-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polysiloxanes, uses
(di-Me, Me hydrogen, polyoxyalkylene-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Onium compounds
(guanidinium, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT **Battery** electrolytes
(nonaq.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polysiloxanes, uses
(polyoxyalkylene-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT Polyoxyalkylenes, uses
(polysiloxane-, **battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT **7439-88-5D**, Iridium, complexes **7440-05-3D**, Palladium, complexes **7440-06-4D**, Platinum, complexes **7440-16-6D**, Rhodium, complexes 7440-31-5D, Tin, complexes 7440-42-8D, Boron, complexes
(Karstedt complexes, dehydrogenation-condensation **catalysts**; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT 67-68-5P, Dimethyl sulfoxide, uses 96-48-0P, γ-Butyrolactone

96-49-1P, Ethylene carbonate 105-58-8P, Diethyl carbonate 108-32-7P, Propylene carbonate 109-99-9P, Tetrahydrofuran, uses 110-71-4P 463-56-9DP, Thiocyanic acid, salts 616-38-6P, Dimethyl carbonate 623-53-0P, Ethyl methyl carbonate 646-06-0P, 1,3-Dioxolane 6140-87-0DP, Stearylsulfonic acid, salts **7439-89-6DP**, Iron, salts **7439-96-5DP**, Manganese, salts **7440-02-0DP**, Nickel, salts **7440-22-4DP**, Silver, salts **7440-48-4DP**, Cobalt, salts **7440-50-8DP**, Copper, salts **7440-66-6DP**, Zinc, salts 7440-70-2DP, Calcium, salts 7601-90-3DP, Perchloric acid, salts 7697-37-2DP, Nitric acid, salts 7791-03-9P, Lithium perchlorate 14283-07-9P, Lithium tetrafluoroborate 16872-11-0DP, Tetrafluoroboric acid, salts 16940-81-1P, **Phosphate**(1-), hexafluoro-, hydrogen 21324-40-3P, Lithium hexafluorophosphate 24991-55-7P, Polyethylene glycol dimethyl ether 25278-06-2DP, Imidosulfuric acid, derivs., salts 27176-87-0DP, Dodecylbenzenesulfonic acid, salts 33454-82-9P, Trifluoromethanesulfonic acid, lithium salt 54322-33-7DP, Methanetrisulfonic acid, derivs., salts 90076-65-6P 132843-44-8P 171483-98-0P, Silanediol, dimethyl-, polymer with methylsilanediol and oxirane, methyl ether, graft
(**battery** electrolytes contg.; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

IT 77-58-7, Dibutyltin dilaurate 14871-41-1, Iridium, carbonylchlorobis(triphenylphosphine)-
(dehydrogenation-condensation **catalysts**; crosslinked polyoxyalkylene-polysiloxanes for use as nonaq. salt-type electrolytes for lithium secondary **batteries**)

L72 ANSWER 2 OF 4 HCA COPYRIGHT 2006 ACS on STN

136:11899 **Electrochemical cell** for the oxidation of organic compounds and electrocatalytic oxidation process. Kuehnle, Adolf; Duda, Mark; Stochniol, Guido; Tanger, Uwe; Zanthoff, Horst-werner (Creavis Gesellschaft Fuer Technologie und Innovation Mbh, Germany). Eur. Pat. Appl. EP 1160357 A1 **20011205**, 21 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (German). CODEN: EPXXDW. APPLICATION: EP 2001-109292 20010417. PRIORITY: DE 2000-10026940 20000530.

AB An **electrolytic cell** consisted of a cathode, a oxygen-conducting solid-state electrolyte and an anode. The anode had a coating of zeolites, mordenites, silicates, **phosphates** or mixed oxides the porosity below 200 nm. The cathode of the perovskite was employed. The org. compds. such as alkanes, olefins and arom. compds. could be oxidized in the described system.

IT **7439-98-7D**, Molybdenum, compds. **7440-06-4**, Platinum, uses

(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)

RN 7439-98-7 HCA
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM C25B003-02
ICS C25B009-00
CC 72-3 (Electrochemistry)
Section cross-reference(s): 47
ST **electrochem cell** oxidn electrocatalytic org
compd
IT **Electrolytic cells**
Oxidation, **electrochemical**
Solid **electrolytes**
(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)
IT Alkanes, reactions
Alkenes, reactions
Aromatic compounds
Organic compounds, reactions
(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)
IT **Phosphates**, uses
Rare earth oxides
Silicates, uses
Transition metal oxides
Zeolite ZSM-5
Zeolites (synthetic), uses
(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)
IT Oxidation **catalysts**
(**electrochem.; electrochem. cell**
for oxidn. of org. compds. and electrocatalytic oxidn. process)
IT 71-43-2, Benzene, reactions
(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)
IT 108-95-2P, Phenol, processes 1313-27-5P, Molybdenum trioxide,
processes 155328-86-2P, Bismuth cobalt iron molybdenum potassium
oxide

(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)

IT 98-55-5, p-Menth-1-en-8-ol 1306-38-3, Cerium dioxide, uses
1344-28-1, Aluminum oxide, uses **7439-98-7D**, Molybdenum,
compds. **7440-06-4**, Platinum, uses 8000-41-7, Terpineol
9004-57-3, Ethyl cellulose 12054-85-2 32480-35-6, Molybdenum
nitrate 148595-66-8, Cobalt iron lanthanum strontium oxide
co0.2fe0.8la0.6sr0.4o3 376646-02-5
(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)

IT 10024-97-2, Nitrogen oxide n2o, uses
(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)

IT 7727-37-9, Nitrogen, reactions 7782-44-7, Oxygen, reactions
(**electrochem. cell** for oxidn. of org. compds.
and electrocatalytic oxidn. process)

L72 ANSWER 3 OF 4 HCA COPYRIGHT 2006 ACS on STN
127:302525 Miniaturized solid state electrochemical CO2 sensors.
Steudel, E.; Birke, P.; Weppner, W. (Chair for Sensors and Solid
State Ionics, Christian Albrechts Univ., Kiel, D-24143, Germany).
Electrochimica Acta, 42(20-22), 3147-3153 (English) **1997**.
CODEN: ELCAAV. ISSN: 0013-4686. Publisher: Elsevier.

AB A thin film solid state electrochem. gas sensor was studied for CO2 detection based on the cell reaction Na+ + OH- + CO2 = NaHCO3. The **galvanic cell** arrangement is Au|NaxCoO2-δ (ref.)|NASICON|Au, SnO2 with the right-hand electrode being exposed to CO2 and O2. Polished NASICON pellets of 300-500 μm thickness were employed as well as electrolytes and substrates. The NaxCoO2-δ ref. material, Au leads and a **catalytic** SnO2 film were deposited by radiofrequency-sputtering. For elec. insulation and encapsulation, the ref. side of the sensor was covered by a thin film of SiO2-xNy. On top of this thin insulating layer a thin Pt film and an integrated Pt-Pt/Rh thermocouple were deposited also by radiofrequency-sputtering for heating the device and for temp. measurement, resp.

IT **7440-57-5**, Gold, analysis
(SnO2 film Au electrode for miniaturized solid state electrochem.
CO2 sensors)

RN 7440-57-5 HCA

CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **7440-06-4**, Platinum, analysis **7440-16-6**, Rhodium,
analysis
(integrated Pt-Pt/Rh thermocouple for miniaturized solid state

electrochem. CO2 sensors)
RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 72, 76
IT **Electrolytic cells**
(gavalnic; using NASICON for miniaturized solid state electrochem. CO2 sensors)
IT **7440-57-5**, Gold, analysis 18282-10-5, Tin oxide (SnO2)
(SnO2 film Au electrode for miniaturized solid state electrochem. CO2 sensors)
IT 58572-20-6P, Sodium zirconium **phosphate** silicate (Na3Zr2(PO4)(SiO4)2)
(for miniaturized solid state electrochem. CO2 sensors)
IT **7440-06-4**, Platinum, analysis **7440-16-6**, Rhodium, analysis
(integrated Pt-Pt/Rh thermocouple for miniaturized solid state electrochem. CO2 sensors)

L72 ANSWER 4 OF 4 HCA COPYRIGHT 2006 ACS on STN
125:206949 Water electrolysis for ozone manufacturing. Shimamune, Takayuki; Nishiki, Yoshinori (Permelec Electrode Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08188895 A2 **19960723** Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-18752 19950111.
AB The electrolysis is carried out by supplying de-ionized water to a water-**electrolytic cell**, using a solid electrolyte of a perfluorocarbon-type ion-exchanging film, to which a cathode and an anode directly adhered, including **phosphate** groups as (a part of) ion-exchanging groups. The anode substance may be Pb oxide or Pt, and the anode product may be a mixt. of O2 and O3. The ion-exchanging film may be (modified) perfluorocarbon sulfonate-type anion-exchanging film. The cathode may be a gas-diffusion electrode. The **electrolysis** omits **cell** cooling to reduce cost and improves electrolysis effectivity.
IT **7440-06-4**, Platinum, uses
(cathode **catalyst**; water electrolysis for ozone manufg.)

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-32-6**, Titanium, uses
(support; water electrolysis for ozone manufg.)
RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IC ICM C25B013-08
ICS C25B009-00
CC 72-9 (Electrochemistry)
Section cross-reference(s): 38, 49
ST water electrolysis ozone manuf; **phosphate** ion exchanging group water electrolysis; perfluorocarbon ion exchanging water electrolysis
IT **Phosphates**, uses
(anion-exchanging membrane contg. **phosphate** for water electrolysis in ozone manuf.)
IT **Electrolytic cells**
(diaphragm, for water electrolysis for ozone manuf.)
IT Ionomers
(fluoropolymers, sulfo-contg., ion exchanger in **cell** for water **electrolysis** with ozone manuf.)
IT Fluoropolymers
(ionomers, sulfo-contg., ion exchanger in **cell** for water **electrolysis** with ozone manuf.)
IT Anion exchangers
(membranes, in **cell** for water **electrolysis** with ozone manuf.)
IT 66796-30-3, Nafion 117
(anion exchanger membrane in **cell** for water **electrolysis** for ozone manuf.)
IT 1309-60-0, Lead oxide (PbO_2) 12645-46-4, Iridium oxide
(anode **catalyst**; water electrolysis for ozone manufg.)
IT 11113-84-1, Ruthenium oxide
(cathode **catalyst**; water electrolysis for ozone manufg.)
IT **7440-06-4**, Platinum, uses
(cathode **catalyst**; water electrolysis for ozone manufg.)
IT **7440-32-6**, Titanium, uses
(support; water electrolysis for ozone manufg.)

=> d 174 1-10 cbib abs hitstr hitind

L74 ANSWER 1 OF 10 HCA COPYRIGHT 2006 ACS on STN
141:246119 Biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode.
Katz, Eugenii; Willner, Itamar (Yissum Research Development Company of the Hebrew University of Jerusalem, Israel). PCT Int. Appl. WO 2004079848 A2 20040916, 44 pp. DESIGNATED STATES: W: AE, AE, AG, AL, AL, AM, AM, AM, AT, AT, AU, AZ, AZ, BA, BB, BG, BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR, CR, CU, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EC, EC, EE, EE, EG, ES, ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN, IS, JP, JP, KE, KE, KG, KG, KP, KP, KP, KR, KR, KZ, KZ, KZ, LC, LK, LR, LS, LS, LT, LU, LV, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ, NA, NI; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, BF, BJ, CF, CG, CI, CM, GA, ML, MR, NE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2004-IL199 20040302. PRIORITY: US 2003-450702P 20030303.

AB The present invention provides a novel electrode carrying on at least a portion of its support surface a hybrid polymer matrix (HPM), a **catalyst** that can **catalyze** a redox reaction and an optional electron mediator group that enhances the elec. contact between the HPM and the **catalyst**, the HPM being capable to be electrochem. changed from a non-conductive state to a conductive state. The electrode of the invention may be used in elec. devices such as **fuel cells**, thus imparting them switchable and tunable properties. The **fuel cell** of the invention may be used as a power source or as a self-powered sensor.

IT **7439-89-6**, Iron, uses **7439-97-6**, Mercury, uses **7440-02-0**, Nickel, uses **7440-22-4**, Silver, uses **7440-47-3**, Chromium, uses **7440-50-8**, Copper, uses **7440-57-5**, Gold, uses **7440-66-6**, Zinc, uses
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-97-6 HCA
CN Mercury (8CI, 9CI) (CA INDEX NAME)

Hg

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-47-3 HCA
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

RN 7440-66-6 HCA
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IT **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses
(substrate coating; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)
RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IC ICM H01M008-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 9, 38
ST **fuel cell** biocatalytic electrode switchable tunable power output; biosensor biocatalytic electrode switchable tunable power output
IT Biosensors
Blood
Body fluid
Carboxyl group
Cerebrospinal fluid
Fuel cell electrodes
Lymph
Phosphate group
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)
IT Alcohols, analysis
Amino acids, analysis
Carbohydrates, analysis
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)
IT Cytochromes
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)
IT Iron-sulfur clusters (protein)
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)
IT **Fuel cells**
(biochem. **fuel cells**; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)
IT **Catalysts**
(electrocatalysts; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)
IT Polyoxyalkylenes, uses
(fluorine- and sulfo-contg., ionomers; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Transition metals, uses
(ions; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-contg., ionomers; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-contg.; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Enzymes, uses
(redox; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT Functional groups
(sulfonate group; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT 50-21-5, Lactic acid, analysis 635-65-4, Bilirubin, analysis
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT 53-59-8, Nadp 53-84-9, Nad 146-14-5, Riboflavin 5'-(trihydrogen diphosphate), P'→5'-ester with adenosine 9000-89-9, L-Aminooxidase 9001-16-5D, Cytochrome oxidase, complex 9001-37-0, Glucose oxidase 9001-60-9, Lactate dehydrogenase 9028-67-5, Choline oxidase 9031-11-2, Lactase 9031-72-5, Alcohol dehydrogenase 14875-96-8, Heme 72909-34-3, Pyrroloquinoline quinone 80619-01-8, Bilirubin oxidase 135622-84-3, Dehydrogenase, fructose
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT **7439-89-6**, Iron, uses **7439-97-6**, Mercury, uses **7440-02-0**, Nickel, uses **7440-22-4**, Silver, uses **7440-47-3**, Chromium, uses **7440-50-8**, Copper, uses **7440-57-5**, Gold, uses **7440-66-6**, Zinc, uses 9003-01-4, Polyacrylic acid 25104-18-1, Polylysine 50851-57-5
(biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

IT **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses 50926-11-9, Ito
(substrate coating; biocatalytic electrode with switchable and tunable power output and **fuel cell** using such electrode)

L74 ANSWER 2 OF 10 HCA
141:9611 Enzyme immobilization for use in biofuel cells and sensors. Minteer, Shelley D.; Akers, Niki L.; Moore, Christine M. (St. Louis University, USA). U.S. Pat. Appl. Publ. US 2004101741 A1 20040527,

33 pp., which (English). CODEN: USXXCO. APPLICATION: US 2003-617452 20030711. PRIORITY: US 2002-429829P 20021127; US 2003-486076P 20030710.

AB Disclosed are bioanodes comprising a quaternary ammonium treated Nafion polymer membrane and a dehydrogenase incorporated within the treated Nafion polymer. The dehydrogenase **catalyzes** the oxidn. of an org. fuel and reduces an adenine dinucleotide. The ion conducting polymer membrane lies juxtaposed to a polymethylene green redox polymer membrane, which serves to electro-oxidize the reduced adenine dinucleotide. The bioanode is used in a **fuel cell** to produce high power densities.

IT **7439-89-6**, Iron, uses **7439-97-6**, Mercury, uses **7440-02-0**, Nickel, uses **7440-06-4**, Platinum, uses **7440-22-4**, Silver, uses **7440-33-7**, Tungsten, uses **7440-50-8**, Copper, uses **7440-57-5**, Gold, uses
(electron conductor; enzyme immobilization for use in biofuel cells and sensors)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-97-6 HCA
CN Mercury (8CI, 9CI) (CA INDEX NAME)

Hg

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-33-7 HCA

CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **7440-04-2D**, Osmium, phenanthrolinedione
(enzyme immobilization for use in biofuel cells and sensors)
RN 7440-04-2 HCA
CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

IC ICM H01M004-90
ICS H01M004-96; H01M008-10; C12N011-08
INCL 429043000; 429044000; 429042000; 429030000; 429013000; 435180000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 7, 38
ST enzyme immobilization biofuel cell sensor; **fuel cell** biochem enzyme immobilization
IT **Fuel cell** cathodes
(biocathode; enzyme immobilization for use in biofuel cells and sensors)
IT **Fuel cells**
(biochem. **fuel cells**; enzyme immobilization for use in biofuel cells and sensors)
IT **Catalysts**
(electrocatalysts; enzyme immobilization for use in biofuel cells and sensors)
IT **7439-89-6**, Iron, uses **7439-97-6**, Mercury, uses
7440-02-0, Nickel, uses **7440-06-4**, Platinum, uses
7440-22-4, Silver, uses **7440-33-7**, Tungsten, uses
7440-50-8, Copper, uses **7440-57-5**, Gold, uses
7782-42-5, Graphite, uses 11129-18-3, Cerium oxide 12597-68-1,
Stainless steel, uses 12612-50-9, Molybdenum sulfide
(electron conductor; enzyme immobilization for use in biofuel

cells and sensors)

IT 61-73-4, Methylene blue 92-31-9, Toluidine blue o 92-82-0D, Phenazine, derivs. 92-84-2, Phenothiazine 98-86-2, Acetophenone, uses 135-67-1, Phenoxazine 139-85-5, 3,4-Dihydroxybenzaldehyde 521-31-3, Luminol 531-53-3, Azure A 531-55-5, Azure B 553-24-2, Neutral red 2381-85-3, Nile blue 2679-01-8, Methylene green 3625-57-8, Nile blue A **7440-04-2D**, Osmium, phenanthrolinedione 9003-01-4, Polyacrylic acid 25013-01-8, Polypyridine 25233-30-1, Polyaniline 25233-34-5, Polythiophene 25265-76-3, Diaminobenzene 27318-90-7, 1,10-Phenanthroline-5,6-dione 30604-81-0, Polypyrrole 37251-80-2, Toluidine blue 38096-29-6, Diaminopyridine 51878-01-4 54258-43-4, 1,10-Phenanthroline-5,6-diol 68455-94-7D, Nitrofluorenone, derivs. 74485-93-1, Poly(difluoroacetylene) 86090-24-6, Brilliant cresyl blue 87257-37-2, Polythionine 103737-36-6, Toluene blue 104934-50-1, Poly(3-hexylthiophene) 126213-51-2, Poly(3,4-ethylenedioxythiophene) 142189-51-3, Poly(thieno[3,4-b]thiophene 150645-85-5, Poly(neutral red) 150645-86-6, Poly(methylene blue) 153312-51-7, Poly(3-(4-fluorophenyl)thiophene 161201-31-6 193265-88-2, Phenothiazin-5-ium, 3-(dimethylamino)-7-(methylamino)-, chloride homopolymer 259737-85-4, Poly(3,4-ethylenedioxypyrrole) 308284-47-1, Benzo[a]phenoxazin-7-ium, 5-amino-9-(diethylamino)-, sulfate (2:1) homopolymer 692776-93-5

(enzyme immobilization for use in biofuel cells and sensors)

IT 50-00-0, Formaldehyde, uses 50-28-2, Estradiol, uses 50-99-7, Glucose, uses 50-99-7, D-Glucose, uses 53-57-6, NADPH 56-73-5, Glucose-6-**phosphate** 56-81-5, Glycerol, uses 57-60-3, Pyruvate, uses 58-22-0, Testosterone 58-68-4, NADH 60-33-3, Linoleic acid, uses 64-17-5, Ethanol, uses 64-20-0, TetramethylAmmonium bromide 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 71-47-6, Formate, uses 71-50-1, Acetate, uses 71-91-0, TetraethylAmmonium bromide 72-89-9, Acetyl co-a 75-07-0, Acetaldehyde, uses 78-83-1, Isobutanol, uses 79-33-4, uses 85-61-0, Coenzyme a, uses 87-78-5, Mannitol 96-41-3, Cyclopentanol 104-54-1, Cinnamyl alcohol 107-18-6, Allyl alcohol, uses 113-21-3, Lactate, uses 116-14-3D, Tetrafluoroethylene, copolymer, with perfluorosulfonic acid 116-31-4, Retinal 123-72-8, Butanal 126-44-3, Citrate, uses 149-61-1, Malate 151-21-3, Sodium dodecyl sulfate, uses 320-77-4 383-86-8, Glycerate 577-11-7, Sodium bis(2-ethylhexyl)sulfosuccinate 598-35-6, Lactaldehyde 608-59-3, Gluconate 633-96-5 820-11-1 866-97-7, TetrapentylAmmonium bromide 921-60-8, L-Glucose 1119-97-7, TetraDecyltrimethylammonium bromide 1333-74-0, Hydrogen, uses 1941-30-6, TetrapropylAmmonium bromide 2002-48-4, Glucuronate 2082-84-0, Decyltrimethylammonium bromide 3615-39-2, Sorbose 7664-41-7, Ammonia, uses 9001-37-0, Glucose oxidase 9001-60-9,

Lactic dehydrogenase 9013-18-7, Acyl-CoA synthase 9014-20-4, Pyruvate dehydrogenase 9028-53-9, Glucose dehydrogenase 9028-84-6, Formaldehyde dehydrogenase 9028-85-7, Formate dehydrogenase 9028-86-8, Aldehyde dehydrogenase 9031-72-5, Alcohol dehydrogenase 9035-82-9, Dehydrogenase 9055-15-6, Oxidoreductase 10326-41-7, uses 12124-97-9, Ammonium bromide 26264-14-2, Propanediol 26566-61-0, Galactose 29354-98-1, Hexadecanol 30237-26-4, Fructose 31103-86-3, Mannose 35296-72-1, Butanol 53414-64-5, Lactose dehydrogenase 62309-51-7, Propanol 66796-30-3, Nafion 117 163294-14-2, Nafion 112
(enzyme immobilization for use in biofuel cells and sensors)

L74 ANSWER 3 OF 10 HCA COPYRIGHT 2006 ACS on STN
140:377977 Methods for operating systems utilizing reformer comprising a hexaaluminate. Labarge, William J.; Kupe, Joachim; Fisher, Galen B.; Kirwan, John Edward; Rahmoeller, Kenneth Mark (USA). U.S. Pat. Appl. Publ. US 2004086432 A1 20040506, 10 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-284973 20021031.

AB Disclosed herein are various embodiments of systems (including vehicle systems and **fuel cell** systems), as well as reformers and methods for operating the systems. In one embodiment, the reformer comprises: a support comprising a reforming **catalyst** and a hexaaluminate comprising a crystal stabilizer disposed in a hexaaluminate crystal structure. Meanwhile, one embodiment of the system comprises: a device selected from the group consisting of an engine, a **fuel cell**, and combinations thereof, and the reformer.

IT **7439-91-0**, Lanthanum, uses **7440-20-2**, Scandium, uses **7440-58-6**, Hafnium, uses **7440-65-5**, Yttrium, uses **7440-67-7**, Zirconium, uses
(**catalyst** stabilizer; methods for operating systems utilizing reformer comprising hexaaluminate)

RN 7439-91-0 HCA
CN Lanthanum (8CI, 9CI) (CA INDEX NAME)

La

RN 7440-20-2 HCA
CN Scandium (8CI, 9CI) (CA INDEX NAME)

Sc

RN 7440-58-6 HCA
CN Hafnium (8CI, 9CI) (CA INDEX NAME)

Hf

RN 7440-65-5 HCA
CN Yttrium (8CI, 9CI) (CA INDEX NAME)

Y

RN 7440-67-7 HCA
CN Zirconium (8CI, 9CI) (CA INDEX NAME)

Zr

IT **7439-89-6**, Iron, uses **7439-96-5**, Manganese, uses
7440-02-0, Nickel, uses **7440-05-3**, Palladium, uses
7440-06-4, Platinum, uses **7440-16-6**, Rhodium, uses
7440-18-8, Ruthenium, uses **7440-22-4**, Silver, uses
7440-48-4, Cobalt, uses **7440-57-5**, Gold, uses
(methods for operating systems utilizing reformer comprising hexaaluminate)
RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-22-4 HCA
CN Silver (8CI, 9CI) (CA INDEX NAME)

Ag

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IT **15438-31-0D**, compd., uses
(support; methods for operating systems utilizing reformer comprising hexaaluminate)
RN 15438-31-0 HCA
CN Iron, ion (Fe2+) (8CI, 9CI) (CA INDEX NAME)

Fe^{2+}

IC ICM B01D050-00
ICS F01N003-00; F01N003-10; B01D053-34
INCL 422177000; 060286000; 060301000
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 59

ST reformer system hexaaluminate comprising; engine system reformer hexaaluminate comprising; **fuel cell** system reformer hexaaluminate comprising

IT Engines
Fuel cells
Reforming apparatus
Reforming **catalysts**
(methods for operating systems utilizing reformer comprising hexaaluminate)

IT 1314-23-4, Zirconium oxide, uses
(Ba-contg., **catalyst** stabilizer; methods for operating systems utilizing reformer comprising hexaaluminate)

IT 7429-90-5, Aluminum, uses **7439-91-0**, Lanthanum, uses 7439-93-2, Lithium, uses 7440-00-8, Neodymium, uses 7440-09-7, Potassium, uses 7440-10-0, Praseodymium, uses 7440-17-7, Rubidium, uses **7440-20-2**, Scandium, uses 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-39-3, Barium, uses 7440-45-1, Cerium, uses **7440-58-6**, Hafnium, uses **7440-65-5**, Yttrium, uses **7440-67-7**, Zirconium, uses 11129-08-1, Barium aluminate
(**catalyst** stabilizer; methods for operating systems utilizing reformer comprising hexaaluminate)

IT 13765-95-2, Zirconium **phosphate**
(coating; methods for operating systems utilizing reformer comprising hexaaluminate)

IT **7439-89-6**, Iron, uses **7439-96-5**, Manganese, uses **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-16-6**, Rhodium, uses **7440-18-8**, Ruthenium, uses **7440-22-4**, Silver, uses **7440-48-4**, Cobalt, uses **7440-57-5**, Gold, uses 12254-17-0, Barium hexaaluminate 50957-60-3, Aluminum Manganese oxide 107636-60-2, Aluminum Barium lanthanum oxide
(methods for operating systems utilizing reformer comprising hexaaluminate)

IT 1302-88-1, Cordierite 1344-28-1, Alumina, uses **15438-31-0D**, compd., uses 107992-37-0, Silicon carbide (Si0-1C0-1)
(support; methods for operating systems utilizing reformer comprising hexaaluminate)

L74 ANSWER 4 OF 10 HCA COPYRIGHT 2006 ACS on STN

140:220752 Solids supporting mass transfer for **fuel cells** and other applications and solutions and methods for forming. Masel, Richard I.; Rice, Cynthia A. (The Board of Trustees of the University of Illinois, USA). U.S. Pat. Appl. Publ. US 2004045816 A1 20040311, 13 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-241306 20020911.

AB The invention concerns a soln. useful for forming a solid that supports mass transfer includes carbon nanotubes and a solvent.

Solids formed using the soln. thereby have carbon nanotubes dispersed therein that are useful for communicating gas and/or elec. charges within the solid. **Catalyst** layers of the invention that include carbon nanotubes can provide high levels of efficiency while requiring low **catalyst** concns.

IT **7439-88-5**, Iridium, uses **7439-96-5**, Manganese, uses **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-04-2**, Osmium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-16-6**, Rhodium, uses **7440-18-8**, Ruthenium, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses **7440-48-4**, Cobalt, uses **7440-62-2**, VAnadium, uses
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

RN 7439-88-5 HCA
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7439-98-7 HCA
CN Molybdenum (8CI, 9CI) (CA INDEX NAME)

Mo

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-04-2 HCA
CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-32-6 HCA
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

RN 7440-33-7 HCA
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-62-2 HCA
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM C25C007-02
INCL 204290140
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 48

ST **fuel cell** solid support mass transfer

IT Nanotubes
(carbon; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Inks
(**catalyst**; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT **Catalysts**
(electrocatalysts; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Sulfonic acids, uses
(perfluorosulfonic acid polymers; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Polymers, uses
(phosphonated; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Solvents
(protic; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT **Fuel cells**
Mass transfer
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Hydrates
Oxides (inorganic), uses
Phosphates, uses
Sulfates, uses
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Alcohols, uses
Aldehydes, uses
Amines, uses
Esters, uses
Ethers, uses
Ketones, uses
(solvent; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

IT Fluoropolymers, uses
(sulfo-contg., perfluoro; solids supporting mass transfer for **fuel cells** and other applications and solns.

and methods for forming)
IT Polymers, uses
(sulfonated; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)
IT Conducting polymers
(support; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)
IT 7440-44-0, Carbon, uses
(nanotubes; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)
IT **7439-88-5**, Iridium, uses **7439-96-5**, Manganese, uses **7439-98-7**, Molybdenum, uses **7440-02-0**, Nickel, uses **7440-04-2**, Osmium, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-16-6**, Rhodium, uses **7440-18-8**, Ruthenium, uses **7440-32-6**, Titanium, uses **7440-33-7**, Tungsten, uses 7440-45-1, Cerium, uses **7440-48-4**, Cobalt, uses **7440-62-2**, VAnadium, uses
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)
IT 7664-93-9, Sulfuric acid, uses
(solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)
IT 7732-18-5, Water, uses
(solvent; solids supporting mass transfer for **fuel cells** and other applications and solns. and methods for forming)

L74 ANSWER 5 OF 10 HCA COPYRIGHT 2006 ACS on STN
137:297411 Description, fabrication and applications of proton conducting electrolyte membranes and membrane electrodes. Hennige, Volker; Hoerpel, Gerhard; Hying, Christian (Creavis Gesellschaft fuer Technologie und Innovation mbH, Germany). PCT Int. Appl. WO 2002080296 A2 **20021010**, 57 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (German). CODEN: PIXXD2. APPLICATION: WO 2002-EP1549 20020214. PRIORITY: DE 2001-10115927 20010330.
AB A proton-conducting, flexible electrolyte membrane for a

fuel cell, which is impermeable for the reactants of a **fuel-cell** reaction, is described. The membrane is a permeable composite material which has a flexible, perforated, ceramic-contg. support. The composite material is impregnated with a proton-conductive material that selectively conducts protons through the membrane.

IT **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses **7440-48-4**, Cobalt, uses
(**catalyst**; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

IT **7440-62-2D**, Vanadium, alkoxides, hydrolyzed
(coatings; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

RN 7440-62-2 HCA
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Zeolite HY
(Zeolyst CBV 600; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**
)
IT Synthetic fibers
(aluminum oxide, support; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**
)
IT Carbon black, uses
Coal, uses
(**catalyst** support; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT Ceramics
(fibers, polycryst., supports; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT Ceramics
(porous, support; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**
)
IT **Fuel cell** separators
Ionic liquids
Membrane electrodes
(proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT Bronsted acids
(proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT Y zeolites
(proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT Ionic conductors
(protonic; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT Ceramic membranes
(support; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT Heteropoly acids
(tungstosilicic; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)
IT 12651-23-9, Titanium hydroxide

(S 500-300, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
(**catalyst** support; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 574-93-6D, Phthalocyanine, metal complexes **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses **7440-48-4**, Cobalt, uses 16941-12-1, Hexachloroplatinic acid
(**catalyst**; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 1344-28-1, Aluminum oxide, uses
(ceramic fibers; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 409-21-2, Silicon carbide, uses 12033-89-5, Silicon nitride, uses
(ceramic; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 1314-23-4, Zirconium oxide, uses 7429-90-5D, Aluminum, alkoxides, hydrolyzed **7440-62-2D**, Vanadium, alkoxides, hydrolyzed 70942-24-4, Si 285
(coatings; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 7631-86-9, Levasil 200, uses
(colloidal, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 506-87-6, Ammonium carbonate 1066-33-7, Ammonium bicarbonate
(pore former; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 78-38-6, Diethyl ethylphosphonate
(proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 78-10-4, Tetraethyl orthosilicate 512-56-1, Methyl **phosphate** 681-84-5, Tetramethyl orthosilicate 762-04-9, Diethyl phosphite 1332-29-2, Tin oxide 2031-67-6, Methyl triethoxy silane 2171-98-4, Zirconium isopropylate 7446-70-0D, Aluminum chloride, hydrolyzed 7578-04-3, Tributylmethylammonium p-toluenesulfonate 7585-20-8, Zirconium acetate 7601-90-3, Perchloric acid, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses 7782-99-2, Sulfurous acid, uses 12067-99-1, Tungstophosphoric acid 13598-36-2, Phosphonic acid 13765-95-2 13826-66-9, Zirconium oxynitrate 17501-44-9, Zirconium acetylacetonate 65039-09-0, 1-Ethyl-3-methylimidazolium

chloride 79917-88-7, 1,3-Dimethylimidazolium chloride
79917-90-1, 1-Butyl-3-methylimidazolium chloride 80432-05-9
105541-66-0, Octyltriphenylphosphonium p-toluenesulfonate
143314-14-1 143314-15-2 143314-16-3, 1-Ethyl-3-methylimidazolium
tetrafluoroborate 145022-44-2, 1-Ethyl-3-methylimidazolium
trifluoromethanesulfonate 174899-65-1 174899-66-2,
1-Butyl-3-methylimidazolium trifluoromethanesulfonate 174899-82-2
438461-55-3 469910-77-8 469910-78-9
(proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 78-10-4D, Tetraethoxysilane, hydrolyzed 546-68-9D, Titanium tetraisopropylate, hydrolyzed 555-31-7D, Aluminum triisopropylate, hydrolyzed 1314-62-1, Vanadium pentoxide, uses 1343-98-2, Silicic acid 2031-67-6D, Methyltriethoxysilane, hydrolyzed 2171-98-4D, Tetraisopropoxyzirconium, hydrolyzed 3087-36-3D, TetraethoxyTitanium, hydrolyzed 10049-08-8, Ruthenium chloride 13463-67-7, Degussa P25, uses
(proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

IT 13746-89-9, Zirconium nitrate
(sol, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for **fuel cells**)

L74 ANSWER 6 OF 10 HCA COPYRIGHT 2006 ACS on STN

135:291090 Fuel oils for **catalytic** reforming in production of **hydrogen** for **fuel cells**. Fukunaga, Tetsuya; Osawa, Mitsuru (Idemitsu Kosan Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001279268 A2 **20011010**, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-93536 20000330.

AB Light olefins such as propylene and/or butene are polymd. and then hydrogenated to give a fuel oil for for **catalytic** reforming in prodn. of **H2** for **fuel cells**. The polymn. **catalyst** may contain $AlCl_3$, BF_3 and its complexes, org. Al, zeolites, silica-alumina and/or solid **phosphates**. The hydrogenation **catalyst** may contain ≥1 active metals of Pd, Ru, Pt, and Ni.

IT **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses
(hydrogenation **catalyst** contg.; fuel oils for **catalytic** reforming in prodn. of **hydrogen** for **fuel cells**)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

IC ICM C10L001-00
ICS B01J023-89; C01B003-38; H01M008-06; C10G045-10; C10G045-40; C10G045-52; C10G050-00; C10G069-02
CC 51-9 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 52, 67
ST hydrocarbon reforming **catalyst hydrogen** prodn **fuel cell**
IT **Fuel cells**
Hydrogenation **catalysts**
Polymerization **catalysts**
(**fuel** oils for **catalytic** reforming in prodn. of **hydrogen** for **fuel cells**)
IT Zeolites (synthetic), uses
(polymn. **catalyst** contg.; fuel oils for **catalytic** reforming in prodn. of **hydrogen** for **fuel cells**)
IT Fuel gas manufacturing
(steam reforming; fuel oils for **catalytic** reforming in prodn. of **hydrogen** for **fuel cells**)
IT 1333-74-0P, Hydrogen, uses
(fuel oils for **catalytic** reforming in prodn. of **hydrogen** for **fuel cells**)
IT **7440-02-0**, Nickel, uses **7440-05-3**, Palladium, uses **7440-06-4**, Platinum, uses **7440-18-8**, Ruthenium, uses
(hydrogenation **catalyst** contg.; fuel oils for

catalytic reforming in prodn. of **hydrogen** for
fuel cells)

IT 115-07-1, Propylene, reactions 25167-67-3, Butene
(polymn. and hydrogenation of; fuel oils for **catalytic** reforming in prodn. of **hydrogen** for **fuel cells**)

IT 7446-70-0, Aluminum trichloride, uses 7637-07-2, Boron trifluoride, uses 159995-97-8, Aluminum silicon oxide
(polymn. **catalyst** contg.; fuel oils for **catalytic** reforming in prodn. of **hydrogen** for **fuel cells**)

L74 ANSWER 7 OF 10 HCA COPYRIGHT 2006 ACS on STN

134:181121 A new class of electrocatalysts and a gas diffusion electrode based thereon. Finkelshtain, Gennadi; Katzman, Yuri; Khidekel, Mikhail; Borover, Gregory (Medis El Ltd., Israel; Friedman, Mark, M.). PCT Int. Appl. WO 2001015253 A1 **20010301**, 36 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US21068 20000803. PRIORITY: US 1999-377749 19990820; US 2000-503592 20000214.

AB In an electrocatalyst based on a highly electroconducting polymer and a transition metal, the transition metal atoms are covalently bonded to heteroatoms of the backbone monomers of the polymer. The covalently bonded transition metal atoms are nucleation sites for **catalytically** active transition metal particles. The complex is prepd. by complexing a highly electroconducting polymer with transition metal coordination ions and then reducing the transition metal ions to neutral atoms. An electrode for a **fuel cell** is made by impregnating an elec. conducting sheet with the **catalytic** complex and drying the impregnated sheet. A **fuel cell** with a liq. anolyte uses the electrode as its cathode. The anolyte includes an aq. soln. of conjugate polybasic acids buffer, such as H_3PO_4-NaH_2PO_4-Na_2HPO_4, and an alc. such as methanol as a reductant.

IT **7439-89-6D**, Iron, complex with electroconducting polymer, uses **7439-96-5D**, Manganese, complex with electroconducting polymer, uses **7440-02-0D**, Nickel, complex with electroconducting polymer, uses **7440-04-2D**, Osmium, complex with electroconducting polymer, uses **7440-05-3D**, Palladium, complex with electroconducting polymer, uses **7440-15-5D**, Rhenium, complex with electroconducting polymer,

uses **7440-16-6D**, Rhodium, complex with electroconducting polymer, uses **7440-18-8D**, Ruthenium, complex with electroconducting polymer, uses **7440-47-3D**, Chromium, complex with electroconducting polymer, uses **7440-48-4D**, Cobalt, complex with electroconducting polymer, uses **7440-50-8D**, Copper, complex with electroconducting polymer, uses **7440-62-2D**, Vanadium, complex with electroconducting polymer, uses
(new class of electrocatalysts and gas diffusion electrode based thereon)

RN 7439-89-6 HCA
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-04-2 HCA
CN Osmium (8CI, 9CI) (CA INDEX NAME)

Os

RN 7440-05-3 HCA
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-15-5 HCA
CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCA
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-47-3 HCA
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

RN 7440-48-4 HCA
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-62-2 HCA
CN Vanadium (8CI, 9CI) (CA INDEX NAME)

V

IC ICM H01M004-86
ICS H01M004-58; H01M004-46; C25B003-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **fuel cell** electrocatalyst gas diffusion
electrode
IT **Catalysts**
(electrocatalysts; new class of electrocatalysts and gas
diffusion electrode based thereon)
IT **Fuel cell** electrodes
(gas diffusion; new class of electrocatalysts and gas diffusion
electrode based thereon)
IT Conducting polymers
Fuel cells

(new class of electrocatalysts and gas diffusion electrode based thereon)

IT **7439-89-6D**, Iron, complex with electroconducting polymer, uses **7439-96-5D**, Manganese, complex with electroconducting polymer, uses **7440-02-0D**, Nickel, complex with electroconducting polymer, uses **7440-04-2D**, Osmium, complex with electroconducting polymer, uses **7440-05-3D**, Palladium, complex with electroconducting polymer, uses **7440-15-5D**, Rhenium, complex with electroconducting polymer, uses **7440-16-6D**, Rhodium, complex with electroconducting polymer, uses **7440-18-8D**, Ruthenium, complex with electroconducting polymer, uses **7440-47-3D**, Chromium, complex with electroconducting polymer, uses **7440-48-4D**, Cobalt, complex with electroconducting polymer, uses **7440-50-8D**, Copper, complex with electroconducting polymer, uses **7440-62-2D**, Vanadium, complex with electroconducting polymer, uses 16941-12-1D, Dihydrogen hexachloroplatinate, reaction products with polyaniline and polypyrrole 16941-92-7D, Dihydrogen hexachloroiridate, reaction products with polyaniline and polypyrrole 25067-54-3, Polyfuran 25233-30-1D, Polyaniline, iridium and platinum chloride complexes 25233-34-5, Polythiophene 30604-81-0D, Polypyrrole, iridium and platinum chloride complexes

(new class of electrocatalysts and gas diffusion electrode based thereon)

IT 7558-79-4, Monohydrogen disodium **phosphate** 7558-80-7, Dihydrogen monosodium **phosphate** 7664-38-2, Phosphoric acid, uses 66796-30-3, Nafion 117

(new class of electrocatalysts and gas diffusion electrode based thereon)

L74 ANSWER 8 OF 10 HCA COPYRIGHT 2006 ACS on STN

125:91275 Mediators suitable for electrochemical regeneration of NADH and NADPH or their analogs. Bloczynski, Michael L.; Corey, Paul F.; Deng, Yingping; Murray, Alison J.; Musho, Matthew K.; Siegmund, Hans-ulrich (Bayer A.-G., USA). U.S. US 5520786 A **19960528**, 14 pp. (English). CODEN: USXXAM. APPLICATION: US 1995-471745 19950606.

AB The electrode for the electrochem. regeneration of the coenzymes dihydronicotinamide adenine dinucleotide (NADH) and dihydronicotinamide adenine dinucleotide **phosphate** (NADPH) or their analogs has imparted on its surface a mediator function comprising ≥1 mediator compd. selected from substituted or unsubstituted 3-phenylimino-3H-phenothiazine or a 3-phenylimino-3H-phenoxazine. Also disclosed is a method of improving the performance of a biochem. **fuel cell** which operates with a dehydrogenase as a **catalyst** and a coenzyme as the energy-transferring redox couple which involves using the improved electrode in the **fuel cell**.

IT **7440-06-4**, Platinum, uses **7440-57-5**, Gold, uses
(mediator-contg. electrode for electrochem. regeneration of coenzymes)
RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-57-5 HCA
CN Gold (8CI, 9CI) (CA INDEX NAME)

Au

IC ICM C25B011-06
ICS C25B011-12; C25B011-14
INCL 204403000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 7
ST NADH regeneration mediator biochem **fuel cell**; NADPH regeneration mediator biochem **fuel cell**; coenzyme regeneration mediator biochem **fuel cell**; phenyliminophenothiazine mediator electrochem regeneration coenzyme; phenyliminophenoxazine mediator electrochem regeneration coenzyme
IT Electrodes
(**fuel-cell**, biochem.; with mediator for electrochem. regeneration of coenzymes)
IT **7440-06-4**, Platinum, uses 7440-44-0, Carbon, uses **7440-57-5**, Gold, uses 7782-42-5, Graphite, uses
(mediator-contg. electrode for electrochem. regeneration of coenzymes)

L74 ANSWER 9 OF 10 HCA
124:187829 Underpotential deposition (UPD) of zinc on platinized platinum and electrooxidation of methanol in the presence of Zn^{2+} ions. Quaiyyum, Abdul; Balais, Willy; Aramata, Akiko; Enyo, Michio (Dep. Applied Chem. Chem. Technol., Dhaka Univ., Dhaka, 1000, Bangladesh). Journal of the Bangladesh Chemical Society, 8(1), 43-51 (English) **1995**. CODEN: JBLSEH. ISSN: 1022-016X. Publisher: Bangladesh Chemical Society.
AB The underpotential deposition (UPD) of Zn^{2+} ions on platinized platinum (pt-Pt) was obsd. in acidic and **phosphate** buffer (pH 6.8) solns. The UPD peak potential on pt-Pt shifted to more pos. potential with the increase of Zn^{2+} ion concn. Probably the peak is due to UPD of Zn^{2+} ions and is assocd. with electron transfer of .apprx.2. The UPD shift for Zn^{2+}/pt-Pt system was

.apprx.1.0 V. The effect of Zn2+ ions on methanol electrooxidn. of pt-Pt surface was obsd. The addn. of Zn2+ ions to the electrolyte side of the **fuel cell** had changed the cyclic voltammetric characteristics of the electrode. Polarization activities at const. potential of 550 mV were obsd. The polarization activities were increased both in H2SO4 and **phosphate** buffer (pH 6.8) in the presence of Zn2+ ions.

IT **7440-06-4**, Platinum, uses
(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn2+ ions)

RN 7440-06-4 HCA

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

IT **7440-66-6**, Zinc, properties
(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn2+ ions)

RN 7440-66-6 HCA

CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

CC 72-2 (Electrochemistry)
Section cross-reference(s): 52, 66, 67

ST underpotential deposition zinc platinum; electrooxidn methanol zinc present; **catalyst** electrochem zinc methanol oxidn

IT **Phosphates**, uses
(**catalytic** activity of zinc in methanol electrochem. oxidn. on platinum in soln. contg.)

IT Oxidation **catalysts**
(electrochem., zinc for methanol)

IT 7664-93-9, Sulfuric acid, uses
(**catalytic** activity of zinc in methanol electrochem. oxidn. on platinum in soln. contg.)

IT **7440-06-4**, Platinum, uses
(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn2+ ions)

IT **7440-66-6**, Zinc, properties
(underpotential deposition of zinc on platinized platinum and electrooxidn. of methanol in presence of Zn2+ ions)

L74 ANSWER 10 OF 10 HCA COPYRIGHT 2006 ACS on STN

107:43166 Methanol-reforming **fuel cells**. Mori, Toshikatsu; Iwamoto, Kazuo; Honchi, Akio; Tamura, Koki (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62086668 A2

19870421 Showa, 6 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1985-224766 19851011.

AB A gas mixt. of MeOH and steam is supplied directly to anodes of **fuel cells** using an acidic electrolyte, and the anodes contain a reforming **catalyst** in their porous C plates and a **catalyst** for the electrochem. oxidn. of the reforming product (H) on 1 side of the plates. Ribbed porous C plates having a porosity of 65% and an av. pore size of 40μ were covered with acetylene black-PTFE sheets with the acetylene black loaded with Pt 10, Ru 5, and Mn 2% **catalyst** to form electrodes. Zr **phosphate** particles (av. size 0.5 mm) loaded with 5 Cu and 10% Zn were filled in the grooves of the electrodes to form anodes for a **fuel cell** using unfilled electrodes as cathodes and Zr **phosphate**-H3PO4 electrolyte tiles. When operated at 200° with a MeOH-60% steam feed, this cell had higher output voltage than a cell using electrodes with **catalyst** layers without Ru and Mn.

IT **7439-96-5**, Manganese, uses and miscellaneous
7440-06-4, Platinum, uses and miscellaneous
7440-18-8, Ruthenium, uses and miscellaneous
7440-47-3, Chromium, uses and miscellaneous
(anodes contg., hydrogen **catalytic**, for phosphoric-acid methanol-reforming **fuel cells**)

RN 7439-96-5 HCA
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-06-4 HCA
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCA
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-47-3 HCA
CN Chromium (8CI, 9CI) (CA INDEX NAME)

Cr

IT **7440-33-7**, Tungsten, uses and miscellaneous

7440-50-8, Copper, uses and miscellaneous **7440-66-6**
, Zinc, uses and miscellaneous
(anodes contg., methanol-reforming, for phosphoric-acid
fuel cells)

RN 7440-33-7 HCA
CN Tungsten (8CI, 9CI) (CA INDEX NAME)

W

RN 7440-50-8 HCA
CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

Cu

RN 7440-66-6 HCA
CN Zinc (7CI, 8CI, 9CI) (CA INDEX NAME)

Zn

IC ICM H01M008-06
ICS H01M004-86
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **fuel cell** anode; reforming **catalyst**
copper zinc; platinum ruthenium **fuel cell** anode;
manganese ruthenium **fuel cell** anode; methanol
reforming **fuel cell**
IT Anodes
Electrodes
(**fuel-cell**, **catalytic**,
phosphoric-acid, methanol internal-reforming)
IT **7439-96-5**, Manganese, uses and miscellaneous
7440-06-4, Platinum, uses and miscellaneous
7440-18-8, Ruthenium, uses and miscellaneous
7440-47-3, Chromium, uses and miscellaneous
(anodes contg., hydrogen **catalytic**, for phosphoric-acid
methanol-reforming **fuel cells**)
IT 1344-70-3, Copper oxide **7440-33-7**, Tungsten, uses and
miscellaneous **7440-50-8**, Copper, uses and miscellaneous
7440-66-6, Zinc, uses and miscellaneous
(anodes contg., methanol-reforming, for phosphoric-acid
fuel cells)